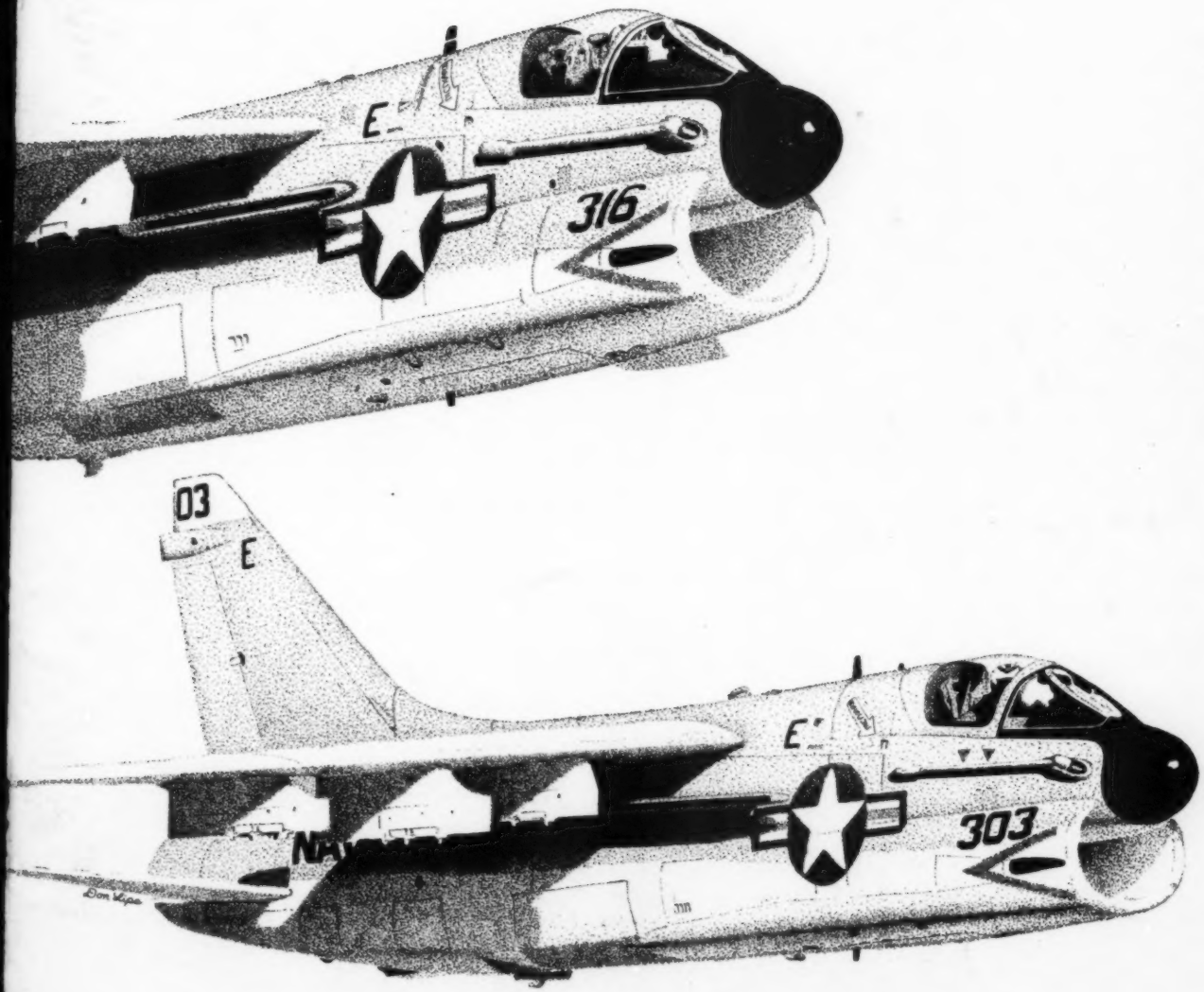
A Naval Safety Center Publication

approach

SEPTEMBER 1971 THE NAVAL AVIATION SAFETY REVIEW



A Well Done from CNO

PRELIMINARY estimates indicate that a new low all-Navy major aircraft accident record of 1.12 per 10,000 hours has been achieved in fiscal year 1971. This rate is significantly lower than any record in 60 years of naval aviation. It is particularly pleasing to note that the new low record has been attained by major aviation commands across the naval organization: Atlantic Fleet, Naval Air Training Command, Naval Air Reserve Training Command and Pacific Fleet Marines each set all-time records for flight safety in fiscal year 1971. The Pacific Fleet was only three percent higher than its all-time low.

As this safety record achievement has come from improvements in the whole naval aviation organization by units engaged in a wide variety of operations and in a variety of aircraft and geographical areas, it cannot be attributed to any technological or magic breakthroughs. Rather, it is the result of attention, determination to improve and sterling professionalism by all involved.

Aviation safety and readiness for our worldwide commitments are synonymous. They go hand-in-hand. Understanding this has raised the professional and personal goals of all responsible for bringing naval aviation to a new level of safety and operating performance. The entire Navy – plane guard destroyers, boot camp indoctrination of future airmen, tanker crews delivering quality aviation POL and Seabees improving air facilities – has contributed to this record achievement.

But a new record becomes a new challenge and a goal to be surpassed. Thus, fiscal year 72 provides an opportunity to dip below 1.0 accidents per 10,000 flight hours.

To all responsible in naval aviation and the Navy as a whole: Well Done.

Admiral E. R. Zumwalt, Jr.
Chief of Naval Operations

Reprint of NAVOP 124

Naval A

THE all-Navy major aircraft accident rate plunged to a record low of 1.12* major accidents per 10,000 flight hours during FY-71, bringing considerable joy to Navy officials, including CNO (see CNO's comments on the inside front cover). As a result, the Navy is now richer, by 49 designated naval aviators and 85 aircraft, than it would have been had the aircraft accident rate remained at the FY-70 level. The humanitarian aspect of this improved safety record is evident, i.e., many irreplaceable lives have been preserved. What may not be quite so obvious is the fact that these savings of human and material resources represent a significant plus in the Navy's posture of readiness.

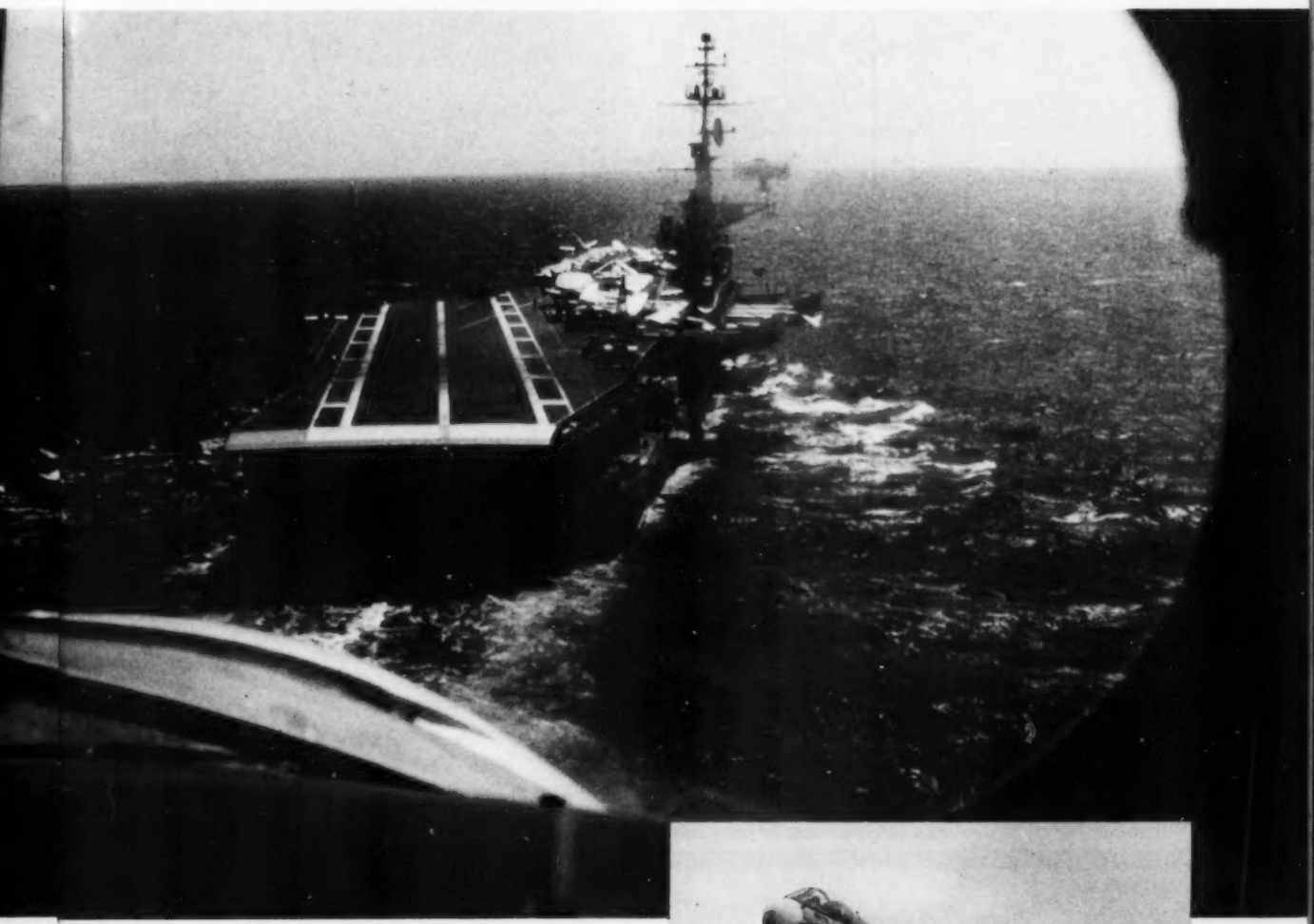
Naval aviation has come a long way in reducing the aircraft accident rate since 1936 (the first year all-Navy major accidents were kept as a separate rate). *At that time, the rate stood at 10.35.* Over the intervening years, there have been some dramatic year-to-year decreases in the rate. For example, between the end of FY-54 and 55, the rate dropped from 5.06 to 3.81 – a whopping reduction for a single year. But, once the rate dropped below 2.0, the year-to-year decreases, understandably, became more modest. Nevertheless, since 1952 there has been an *unbroken year-to-year decreasing trend* in the major aircraft accident rate, *except for one five-year period, i.e., FY-66 through 70.* The reason for this five-year hiatus in the decreasing trend is open to discussion.

Where do we go from here? What is the ultimate goal in terms of naval aviation safety? The ultimate goal is to reduce the accident rate to the "irreducible minimum" while still retaining maximum readiness of operating forces. Unfortunately, no one can define what constitutes the *irreducible minimum*. Even so, there is considerable evidence that safety in naval aviation has not yet approached the point from which no further progress can be made. *For example, the major aircraft*

* Estimated rate

illus 2-5

l Aviation Safety.



accident rate for the entire month of May 1971 was a mere .58! This suggests the possibility of a vastly improved accident rate at some indefinite future date.

What about short-range goals? What is a realistic goal to strive for in FY-72? CNO has provided the answer. He stated in his message that "FY-72 provides an opportunity to dip below 1.0 accidents per 10,000 hours."

Continued

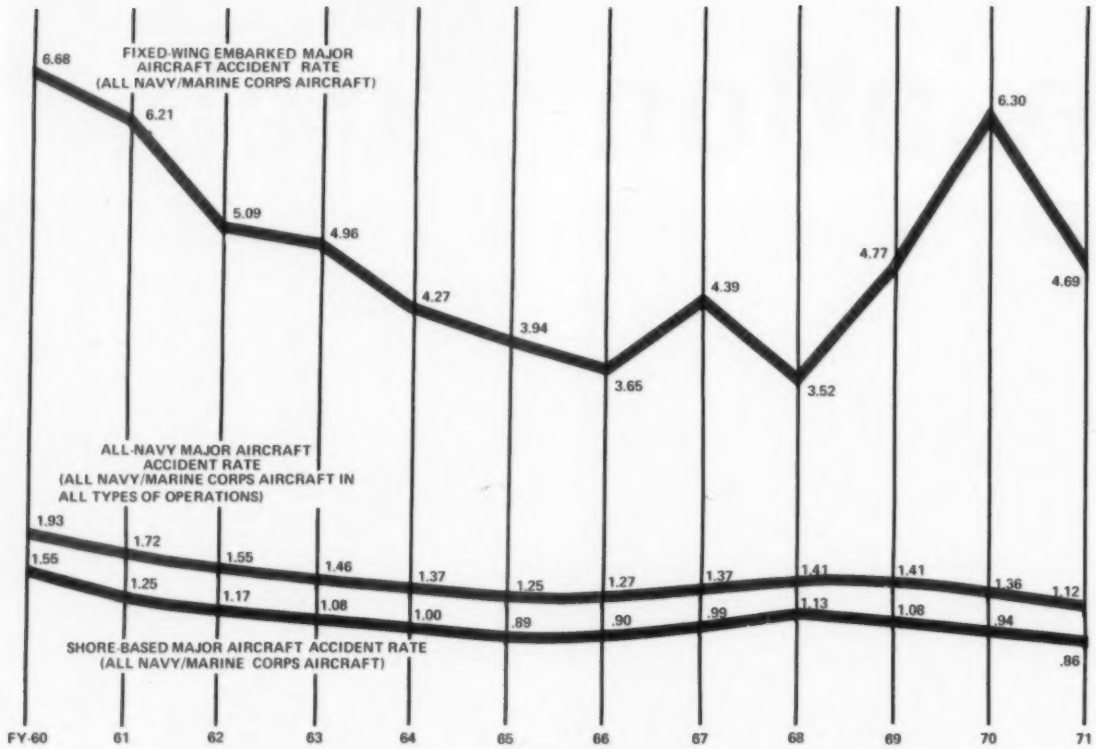


Chart 1

Pursuing the Goal

There are a number of areas which might profitably be explored when considering both the long and short-range goals in naval aviation safety. The differences in accident rates and cause factors among various classes of aircraft and among various phases of flight are examples. These are good points of discussion which will be pursued further in future APPROACH articles. However, there is one area of operations of particular interest at this time; namely, fixed-wing carrier operations.

Embarked Operations

Chart 1 has been prepared as a point of discussion. This chart covers the period FY-60 through 71 and shows:

- The all-Navy major aircraft accident rate (includes all Navy/Marine Corps aircraft).
- The fixed-wing embarked major aircraft accident rate (includes all Navy/Marine Corps aircraft).
- The shore-based major aircraft accident rate (includes all Navy and Marine Corps aircraft in all shore-based operations).

One of the most noticeable things displayed on Chart 1 is the fact that the accident rate for fixed-wing embarked operations is substantially higher than is either the all-Navy rate or the shore-based rate. This should be no cause for surprise to anyone. Carrier takeoffs and landings, for example, are recognized by even the most uninitiated observer as involving more potential hazards than field takeoffs and landings. Thus, at this point, there is no need to comment further on the fact that the embarked accident rate is higher than either of the other two rates depicted. Rather, we will comment on the *trends* evident in the various rates.

From 1960 to 1965, the trend for all three rates was decreasing. This is what one might expect. For, even though the rate for embarked operations is expected to be higher than the others, there is no reason to believe that the rate cannot be lowered year-by-year in the same manner as the all-Navy rate, if sufficient (and increasing) attention is paid to safety of operations.

Note that during the period FY-66 through 70, the all-Navy rate and the shore-based rate show slight increases (above the FY-65 rate). But, look at the embarked rate during the period FY-67 through 71. There are many ups and downs, with an average rate

Accident Rates

Accident rates are usually calculated on the basis of the number of occurrences in 10,000 flight hours, but not always. They can be calculated on the basis of 10,000 flights (sorties), 10,000 landings or any other convenient denominator. Such rates can be calculated for all aircraft, for classes of aircraft and even for individual models or series of aircraft. Furthermore, rates can be calculated for various types of operations or for personnel factors. The point is, there are many accident rates and this fact can be confusing to the uninitiated.

When one speaks of the "all-Navy major aircraft accident rate," he is referring to the average number of major aircraft accidents which occur in 10,000 flight hours. This one rate encompasses all types of Navy and Marine Corps aircraft and all types of operations.

Naval personnel who desire more information on various rates and statistics which are routinely calculated and published by the NAVSAFECEN should consult the "U. S. Naval/Marine Corps Aviation Statistical Summary," published annually by the NAVSAFECEN. This publication is classified Confidential but commanding officers are authorized to disseminate portions of it in promoting flight safety.

which is substantially higher than the rate for FY-66. So, granted that carrier operations are more difficult than shore-based ops, it is obvious that fixed-wing carrier operations experienced accident producing forces which were not similarly affecting shore-based operations. A number of these forces have been identified during studies and statistical analysis at the Center. The relationship of each to the total accident rate and the present downward trend will be discussed in detail in a forthcoming article.

This safety record achievement is the result of attention, determination to improve and sterling professionalism by all involved.
CNO

As noted by CNO, the reduction in accident occurrences is encouraging and now is an appropriate time to rededicate ourselves to further improvement in safety of all Navy aircraft operations and particularly in fixed-wing carrier operations. To this end, it is planned to print as many articles on safety in carrier operations as practicable during the next year or so. For example, an article on a new system of carrier air traffic control is planned for an issue in the near future, as well as an article on the development and current use of the ACLS (all-weather carrier landing system). In addition, a description and evaluation writeup on the A-7 night carrier landing trainer is forthcoming.

The Future Outlook

The CNO-suggested goal of 1.0 in FY-72 appears to be eminently attainable. In fact, a preliminary review of statistics shows that the all-Navy rate for the *calendar* year 1971, to the end of July, is less than 1.0. This shows that it can be done. Furthermore, it appears that all that is necessary to reach the goal of 1.0 in FY-72 is for every naval aviation unit to continue to operate in the highly professional manner displayed during the calendar year to date. ◄

Contribute Your Thoughts

We recognize that carrier operating expertise exists only in the Fleet. Therefore, thoughtful and thought-provoking articles on any phase of carrier operations (with safety implications) are solicited from our readers. We are particularly interested in getting first-hand views on problem areas from individuals who are now or have recently been directly involved in carrier operations. We do not wish to impose limitations on an author's creativity, but would suggest that the article not exceed 4000 words and that an attempt be made to offer solutions to existing safety problems. Should the author feel more inclined toward constructive criticism – this too is welcomed and will be considered for publication as well.

Short Snorts

A negative mind is man's greatest enemy and a scourge to the human race.
Ace L.

Join the Weight Watchers

PERSONNEL were loading external cargo on a CH-53 at a pick-up zone in Vietnam. The pilot of the *Sea Stallion* was informed that the load weighed 9000 pounds. As the pilot raised the load off the deck, he found he had to use considerably more power than required on previous loads of the same reported weight. He asked loading personnel to check the weight again as he proceeded to the drop zone. Enroute a sling strap broke, dropping part of the load (2000 pounds of explosives) from the aircraft. When the pilot returned to the pick-up zone he was informed that the load had actually weighed 16,000 pounds. All slings of this type have a rating of 10,000 pounds. In other words the gent flying this bird was carrying 60 percent more weight than the sling could hold; no wonder part of the load peppered the countryside. All you fellers responsible for loading external cargo on helos, come join the *weight watchers*. Cargo falling from an aircraft, especially if it's of an explosive nature, can ruin the whole day for a lot of people.

Compound Emergency

STOOFMOUSES, how current are you on your S-2 procedures? You are airborne on a training flight, NATOPS evaluation, with the port engine feathered (not for cause) when the starboard CSD light illuminates. What are you going to do and in what sequence? This situation arose one bright sunny day and the pilots concerned discussed the emergency, concurred on the action to be taken and the check pilot pulled the CSD disconnect handle on the starboard engine. The aircraft was flown back to base and an uneventful single-engine landing was made.

The CO of the squadron, in commenting on the action of his pilots, opined that the hazards involved in making a single-engine approach and landing with no electrical power are considerably greater than those involved in delaying CSD disconnect until completing the inflight restart checklist, at least to where the feather button is pulled. NAVSAFECEN S-2 analyst concurs.

There is no doubt that the *Stoof* is a mighty dependable aircraft but flying with no "juice" (no rudder assist, higher minimum control speed, no trim, no radios, no gear or flap indicators, no warning devices) is just a tad short of being in extremis.

Construction FOD

WHILE taxiing back to the squadron area after a flight, the E-2A pilot and copilot noted potential FOD debris on the taxiway adjacent to a construction area. However no debris was observed to enter the engines and all instruments read normal. During the postflight inspection it was discovered that the starboard engine had in fact received FOD as two stator vanes were buckled and four of the first stage compressor blades had chunks of metal torn from them. The most probable cause of the damage was believed to be FOD material from the construction site.

Whenever construction is in progress near taxiways/runways it is the responsibility of the airfield operator to ensure that his personnel monitor the presence of potential FOD material and if found, to close the taxiway/runway until it is removed.

Early Secure

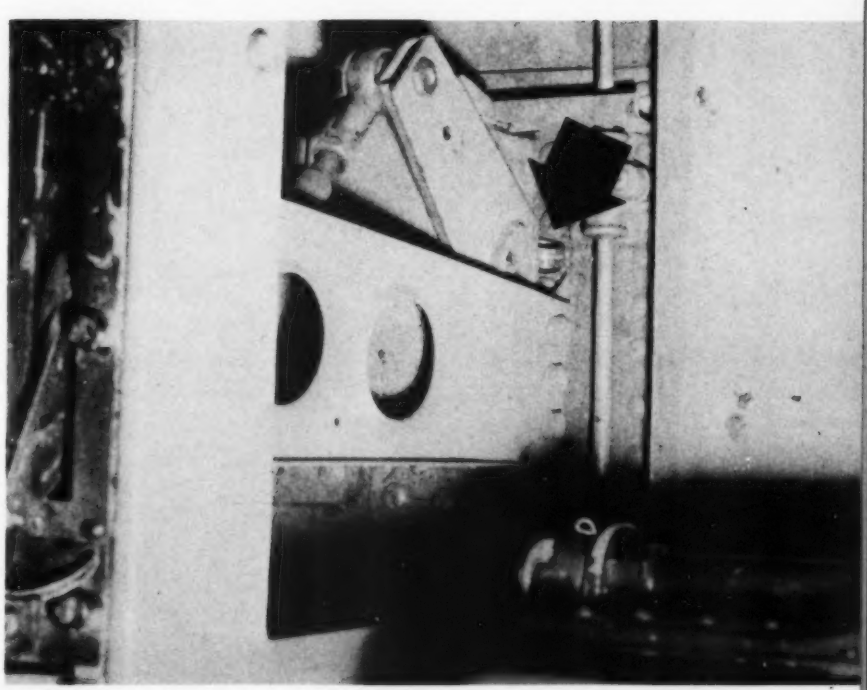
A P-3B crew was on an over-water tactical flight with the No. 1 engine secured for loitering. Following a rigging run, the PPC called for 3500 SHP and commenced a climb. Approximately five seconds after the application of power, an audible propeller surge occurred and the No. 4 tachometer fluctuated between 98.5 and 100

percent. As the pilot started to call for SYNCH off, the tachometer showed a rapid decay of RPM through 95 percent. The pilot instead called for feather of the No. 4 engine while at an altitude of 900 feet MSL. The pilot did not note SHP, TIT or fuel flow prior to engine shutdown. The engine was secured with the emergency shutdown handle and the engine shutdown checklist completed. The No. 1 engine was restarted and the mission aborted. The aircraft returned to the NAS where a three-engine landing was made without incident. Postflight inspection by squadron maintenance personnel revealed that the No. 4 tachometer generator had failed.

The squadron CO in his comments stated, "The PPC should have stayed on his original course of action. Initial detection of the RPM fluctuation occurred far enough in advance of the final decay to permit comfortable step-by-step execution of the NATOPS procedures. These procedures for an RPM fluctuation in flight call for securing the synch servo of the affected engine as the initial step. Had this been done, engine/propeller performance would have normalized and the failure of the tachometer generator would have become apparent. Only if the normal sequence of procedures failed to correct the situation should the engine have been shut down. A tactical mission was aborted and a three-engine landing affected as a direct result of non-adherence to NATOPS."

Hung Throttle

IF one has to make a choice between a throttle that cannot be advanced or a throttle that cannot be retarded most pilots would choose the latter. During carquals the pilot of a TF-9J made an arrested landing and when the aircraft stopped he found he could not retard the throttle below 70 percent. The engine was secured with the fuel master switch and later investigation revealed that the cockpit gear handle light bulb retaining nut had lodged between the throttle quadrant bellcrank linkage and the cockpit deck. The photograph shows the nut in the jammed position but how it worked loose, or when, remains a mystery.



The arrow points to the retaining nut jammed between cockpit floor and the throttle quadrant bellcrank linkage of the front cockpit.

Almost CAT-astrophic

SIMULTANEOUSLY with the tensioning of an A-6A on the No. 4 cat, another A-6A was taxied to the No. 3 cat with the wings spread. The taxiing A-6's position was such that its port wing overlapped the starboard wing of the A-6 on No. 4 cat. The cat officer had already given the fire signal when he recognized the overlapping situation. He and the safety director immediately gave an emergency stop signal to the A-6 taxi director but he failed to observe the signal. As a result the starboard wingtip speed brake of the launching A-6 struck the taxiing A-6 and tore six inches from the trailing edge of its port outboard wing slat. The launching A-6 received no structural damage.

The investigation into the causes for this mishap revealed that the taxi director was inexperienced and had become so engrossed in nose lineup that he failed to see the stop signal and taxied the A-6 forward into the path of the aircraft on the No. 4 cat.

This is another case where something more serious than an aircraft incident could have occurred due to someone's inattention. When an inexperienced taxi director is learning the ropes, an experienced "yellow shirt" should be at his shoulder to make darn sure his actions are correct, especially around catapults. ◄

Pull Up!

THE exercise was one which involved the squadron and a submarine for a couple of days of 'round-the-clock operations. It would tax the efforts of all hands but it also was a golden opportunity to upgrade all crews. One thing can be said for VP, VS and HS squadrons; opportunities for them to work with submarines for extended periods come few and far between. Nevertheless, this was one of those rare occasions and the squadron went to battle stations. The CO scheduled a series of briefings with key personnel to ensure that they knew what the forthcoming exercise was all about and what he expected of them. Throughout, he stressed safety in maintenance, ground handling and flight operations. After the AOM, the skipper departed the readyroom, leaving behind him an air of intense excitement. One pilot said he had waited 10 years for just such an opportunity. Another said good naturedly that he would bet anyone his crew would get a higher score than anyone else. Someone even proposed that a penalty of a round of drinks at happy hour be imposed on any crew not meeting their scheduled takeoff. There was, of course, no premonition that tragedy would strike before the exercise was over.

The first day's flights went like clockwork. The pilots piloted. The aircraft flew. The black boxes blacked. The traces traced. Maintenance maintained. Just as advertised! Only one fly in the ointment became evident. One crew did not complete their assigned tasks on station and as a result the flight schedule had to be changed. Therein hangs a tale. Since this crew had not completed the necessary preliminary exercises, it was necessary to reschedule them for another daylight flight the *second day* and swap with another crew which had flown a night flight the first night (but had qualified).

!Pul...

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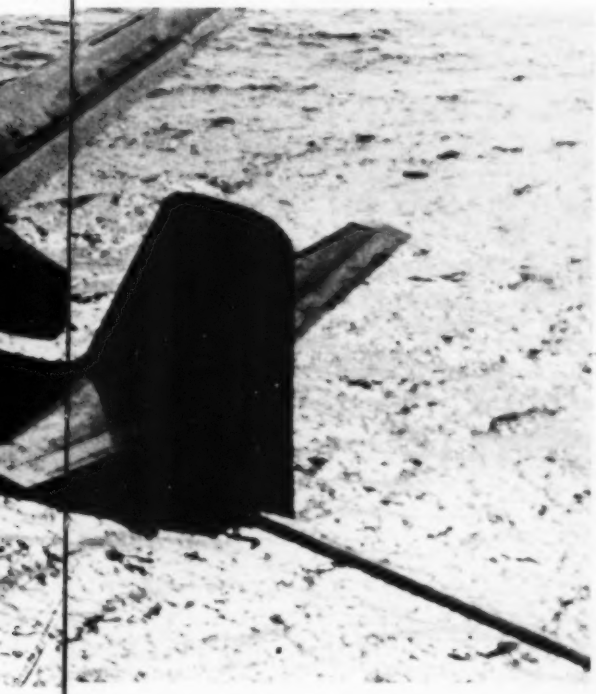

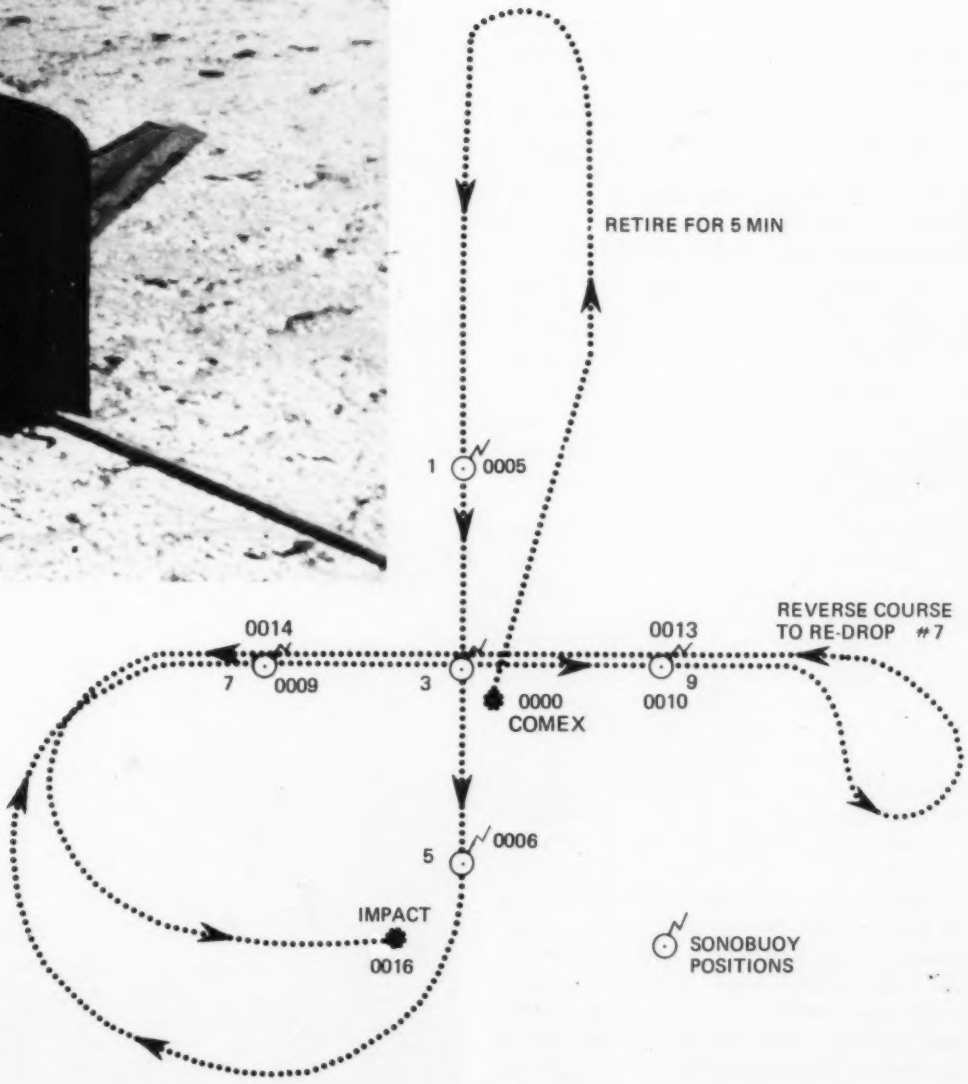

FIG. 1

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Continued

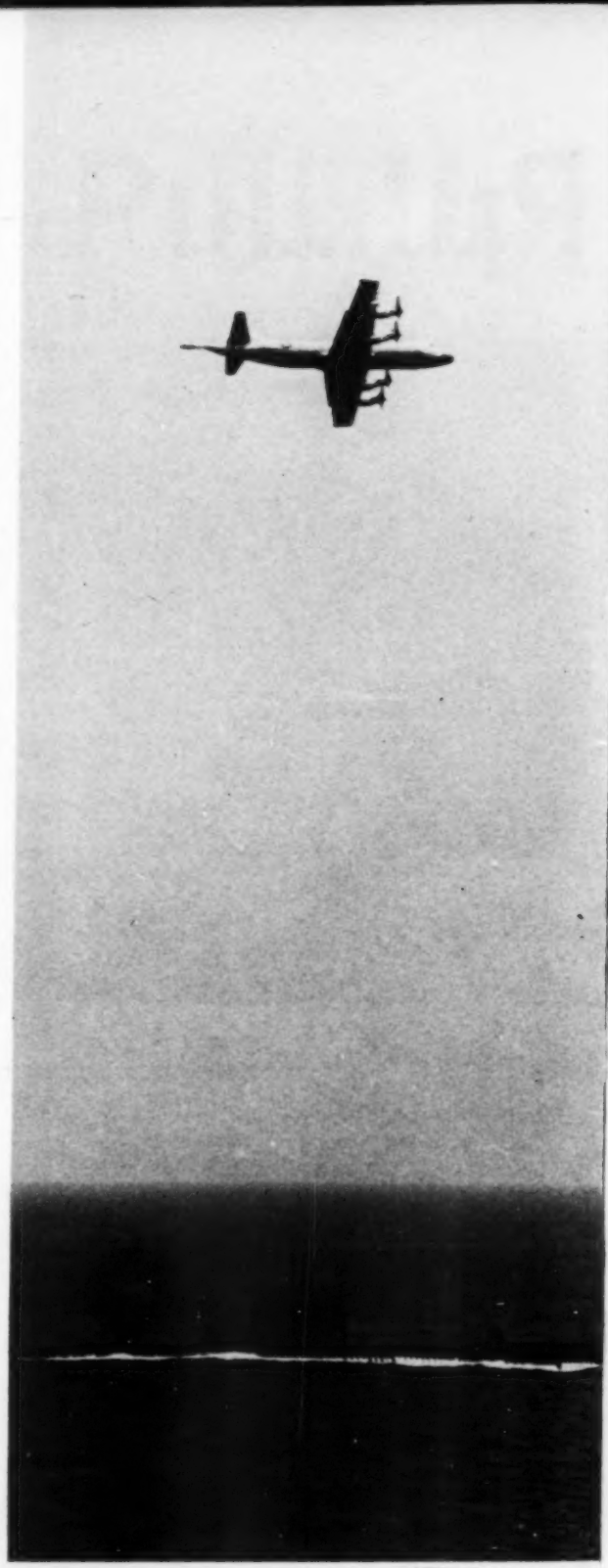
Although the crew which had to fly back-to-back night flights was disappointed, the schedule was nonetheless changed. They would much rather have flown than cancelled out. The crew was notified early enough to get ample rest and the subsequent investigation did not disclose anything untoward in that respect.

The crew reported a little early for briefing and, upon conclusion, preflighted the aircraft and turned up with plenty of time before scheduled takeoff. They acknowledged clearance and climb instructions and, at T minus 10 minutes, were airborne. In due course they were switched to Center and subsequently released to proceed to the tactical area and shift to tactical frequency. Arriving in the operating area half an hour early they saw the anti-collision light of the squadron aircraft they would relieve. After an exchange of pleasantries and upon learning the crew on station still had about 30 minutes to finish up, the ill-fated crew discussed what they would do. While awaiting their turn, they decided to withdraw 15 or 20 miles for a short pilot warmup period and to start plot stabilization.

After the aircraft on station had finished and departed for Homeplate, the pilot of the relieving crew closed the submarine and told the sub they would like to do a short exercise, which would only take 30 minutes or so, to be followed by a free-for-all. The sub advised they were out there without much else to do and whatever the aircraft crew wanted would be fine with them. (You just can't beat those submariners for cooperation.)

The pilot began the exercise by withdrawing for about five minutes and then, on his run-in, the crew began to drop their sonobuoys. (Figure 1 illustrates the buoy pattern.) During the fourth turn, 16 minutes after commencing the exercise, the aircraft impacted the water. The crash occurred an hour and a half after takeoff. Of the four survivors there were two aircrewmen, one pilot and another officer. The weather and sea conditions were almost ideal for flying. The night was dark (no moon), but there were only a few scattered clouds between 3000 and 5000 feet, visibility was good, winds were northerly less than 10 knots and the sea was calm.

In reconstructing the events which preceded the crash the AAB was fortunate in being able to question the four survivors. As one might suspect, except for the pilot, the others were all busy at their various duty stations and were unable to shed much light about anything which took place before finding themselves in the water. However, several facts were established during interviews with the pilot. The aircraft was being flown in the pattern at 650 feet and normal speed. The baro-hold was on. The radar altimeter was operating and set



for 500 feet. The pilot was in a left turn of 30 degrees bank or less. There were no indications or warnings that they were descending and no control difficulties. Just a second prior to the crash the pilot recognized a reflection of the aircraft lights on the water and realized that impact was imminent. Before he could take corrective action or shout a warning, impact occurred.

Eventually the four survivors got together by swimming to a raft that one of them had partially inflated. Although most of them were suffering from burns, shock, various injuries and exposure they kept together and by taking turns on the hand pump kept the raft reasonably well inflated. At the end of the time limit for the exercise the sub surfaced and a lookout reported a strobe light. The sub headed for the strobe light and a few minutes later the sub lookouts reported sighting two red flares. Almost two hours after the crash the submarine drew alongside the liferaft and rescued the survivors. The sub crew continued to search the area for additional survivors during the night without success. With daylight, additional aircraft and ships were at the scene but the search was in vain.

Night ASW flights require the nth degree of *concentration* on the part of pilots as well as precision flying at its best. Low-level flights are hairy enough during daylight but even more so at night. They require *total concentration* by the PPC, *continuous backup* by the copilot, *constant vigilance* by the plane captain and *concerted effort* by all hands to keep distractions to a minimum. Above all, the PPC must keep up a constant instrument scan since the difference between a level turn at 500 feet and one which ends up in the water can literally be measured in seconds. The accident investigation disclosed a breakdown in one or more of these points.

Antisubmarine flight crews, both fixed-wing and rotary-wing, spend many hours training and practicing the techniques and tactics necessary to search out and destroy submarines. Any weak link in the crew chain can nullify the efforts of the entire crew. Teamwork and coordination must be practiced over and over again until finely honed. The safety of the crew depends on those "up front" and they, *above all*, must be absolutely errorless. Nothing must be permitted to take the pilot's mind off the immediate task at hand – *that of flying the aircraft.* Pilots should be so resolute of purpose and so precise in flying as to be completely immune to normal distraction. Those who lack this concentration must develop it – those who have it must keep it. It's a *real* lifesaver. ◄

Soliloquy on a Safe Landing

IT'S 0915 as the LSO debriefs my 0850 landing . . . says fair pass, high-all-the-way to a come-down-in-close . . . skipped three wire for a four-wire engagement . . . happy with these words . . . in fact, thank my lucky stars to be home again . . . could have been worse. Much worse. Hmmm . . . let's see . . . it all began 10 days ago . . .

In port for six days . . . EMCON steaming with no flight ops for three days . . . at anchor for one day . . . then finally it's time to fly and, baby, it's max effort exercise with mucho flying . . .

My first flight is a double cycle extended to a triple cycle . . . my butt hurts . . . on deck at 1930, chew out schedules officer because I have a 0115 brief . . . hit the sack, can't sleep . . . get up and watch the end of flick . . . back to rack . . . some fool is rattling paper in the hall or passageway or wherever . . . knock, knock.

Seaman at the door wants to know if he can tape my door . . . says they are going to paint the area . . . permission denied, have to leave in two hours to fly . . . Say, who sent you here? Your division officer, you say?

To paint or not to paint? Ah, what a stupid question at this time of night . . . stupid question and paint . . . awake until brief time.

Briefing in IOIC at 0115 with paint fumes on brain . . . man aircraft at 0215 but bird is down . . . switch box lunches to single cycle aircraft, get fuel topped off for a triple cycle.

Aircraft on deck is now up and ready. But Air Ops, sir, we can't hack a triple cycle at this point . . . flail, flail, man up at 0345 with no further brief. Missed my kneeboard on the way out . . . even the now obsolete brief is not available . . . double or triple cycle? Who knows? Turn up to sit on deck and burn needed gas for half hour . . .

Airborne . . . worst suspicions of crew confirmed as copilot and I alternate napping . . . AFCS is down so one of us has to be awake . . . request ship to confirm we are double cycle but receive negative reply and gleeful instructions that we are triple cycle . . . It's max conserve now . . . to heck with the radar platform . . . I'm going to have divert fuel even though it is a long, long way to the bingo field . . . finally the landing (whew) and debrief . . .

I'm tired . . . wonder if I could have handled an emergency? As plane commander, I should have insisted on a double cycle . . . aircraft accident board would have said junior plane commander overextended capabilities with resultant ramp

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT, PREVENT AN ACCIDENT

strike . . . maybe fly into water . . . or . . .

This junior CAPC knows he was overextended on this night . . . but, admiral, captain, air ops, skipper, "painting division officer," . . . isn't it hard to look into the mirror and condemn junior CAPC while mumbling something about operational commitments . . . ?

E-2B Mouse

Let's hope this is a bad dream. This couldn't really happen like this, could it?

Call a Spade a Spade

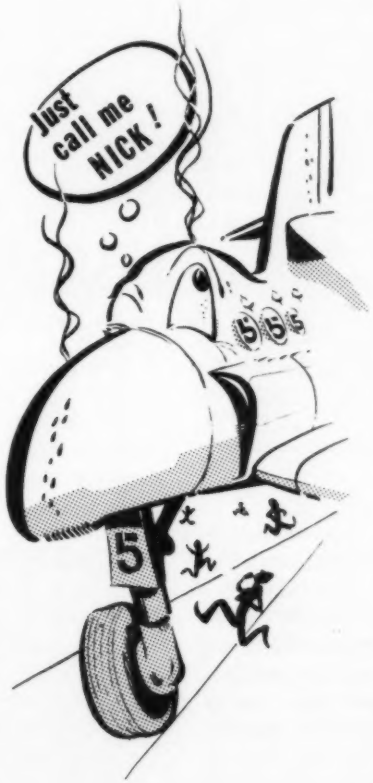
ONBOARD my ship there is a practice which has the potential to cause trouble. Specifically, aircraft are often identified by nicknames which are not always understood by all concerned. For example, an electrical fire somehow got started on an aircraft with a side number of 111. Hangar deck control broadcast, "Fire on triple sticks." The aircraft happened to be directly outside my shop, however, I failed to recognize this fact because I was not familiar with the meaning of "triple sticks." Instead, I mistakenly thought the aircraft involved had a side number which ended in six. I therefore rushed toward a plane some distance away only to recognize shortly thereafter that the fire was on an aircraft which I had already passed. I quickly retraced my steps and directed a nearby man to secure electrical power at the bulkhead. The fire then stopped.

Not too much time was wasted and little additional damage was done by the delay in identifying the aircraft – *in this case.* But in other circumstances the outcome might have been entirely different. Using names aboard ship like "triple sticks," or "triple nickel," is asking for trouble unless the names are fully understood by all. This is usually not the case.

I recommend all hands use standard terms of identification when referring to aircraft, equipment or supplies. Call a spade a spade.

Carrier Mouse

While a few seconds might make little difference in an electrical fire, the saving of seconds in a fuel or ordnance fire could mean the difference between incident and disaster. Good recommendation. We're glad to pass it on.



Traex

DURING an amphibious force training exercise, a large group of assault troops were to be moved ashore by several CH-53 helicopters.

The pilot of one of the helicopters was briefed before departing the LPH that there was the possibility of encountering simulated "enemy" fire. After landing in the zone, the pilot gave the word to the crewchief to offload the troops. The ramp was lowered and the troops began to exit the aircraft. Suddenly a number of "aggressors" began "firing" at the helicopter. The pilot said over the ICS that he was lifting, applied power and lifted from the zone.

Several of the troops still on the ramp began to tumble off like unsecured cargo as the helicopter became airborne. A few fell from 6 to 8 feet while the last one tumbled off from an estimated 40 feet in the air! The pilot was advised by his wingman that his ramp was open and that there was an injured man in the zone. The helicopter continued to the ship to pick up a stretcher.

Fortunately the man was not seriously injured. However, if he had fallen off a second or two later he would have fallen over the side of an 800-foot cliff – a fatal drop for sure! I maintain that someone should formulate definite SOP (standard operating procedures) for troop offloading *before* a fatality occurs.

Irritated Mouse

Good Grief! This pilot got carried away with play-acting and violated just about every written and unwritten rule of safety there is. Someone had better first spell out common sense for him and then drill him again on what crew coordination means and how it applies to the offloading of troops. Then, have him read the book on assault tactics and finally, review the CH-53 NATOPS manual and squadron SOP until he has committed the appropriate parts to memory and can repeat them verbatim. ◄

Vision at High Altitudes

By Group Captain T. C. D. Whiteside, MBE, R.A.F.

The following article appears in *APPROACH* with the kind permission of the author, a recognized authority in the field of vision. It first appeared in 1964 in the *RAF Flight Safety Review and Digest.*

IT IS fairly true to say that the problems of vision in flight at high altitudes, which are related neither to decompression of the pilot nor to the speed of the aircraft or effects of acceleration, are caused by the environment – an environment which differs so markedly from that encountered at lower altitudes that the visual system, although admirably suited for a purely terrestrial existence, becomes unable to function satisfactorily.

The change in the environment which gives rise to difficulties in seeing is due simply to the fact that, at high altitude, one has partly traversed the earth's atmosphere.

Since the brightness of the sky is caused by the scattering of light by atmospheric particles, the atmosphere appears as a bright layer above the earth. At any height in this layer, the sky brightness is proportional to the atmospheric pressure, so it is obvious that in a cloudless sky, the difference in brightness between say 20,000 feet and 30,000 feet will be much greater than the difference in brightness between 60,000 feet and 70,000 feet. Equal increases in altitude are, therefore, accompanied by progressively smaller changes in sky brightness. Indeed, as was predicted earlier and as we now know from direct observation by the astronauts, our planet seems to be surrounded by a bright envelope of atmosphere whose luminance is greatest near the surface of the earth.

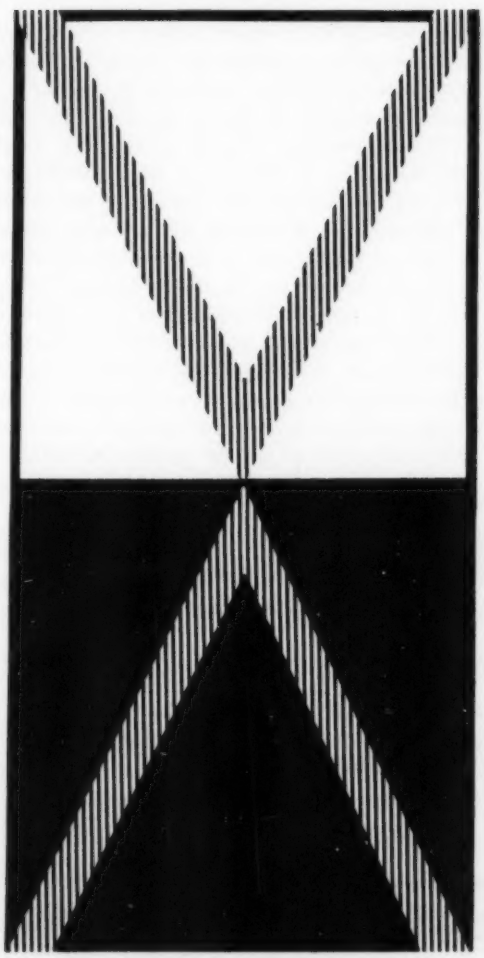
In any flight over 20,000 feet one has, therefore, traversed most of this envelope of bright atmosphere so that most of the light comes from below instead of from above. At 40,000 feet, for example, one has already traversed four-fifths of this atmosphere, so the reversal in light distribution is even more marked. Our eyebrows and the recession of the eyes beneath the brow enable us to cope with glare coming from above, but this unnatural reversal allows light to flood into the eye unhindered, and consequently we experience glare more readily when it is coming, as in this case, from below eye level. This is one of the most obvious and most familiar causes of visual discomfort in flight at high altitude.

As a result of this excessive light flooding into the

eyes from below eye level, there is the familiar problem of difficulty in reading an instrument panel, particularly if it is in shadow. Some of the reasons for this difficulty are purely physical in the sense that the instrument panel in shadow may receive less light than it would at lower altitude and is, therefore, darker. But there are also physiological effects which increase this difficulty in seeing since the intense brightness outside makes the already dark instrument panel appear even darker. The same effect is seen in the accompanying figure of a well-known illusion describing this phenomenon of "simultaneous contrast." The two "Vs" shown are of equal greyness.

If the eyes are shielded from this glare source, which comes from the cloud floor or generally from below even when there is no cloud, there is an almost immediate improvement in visibility.

A second problem associated with the type of sky



encountered frequently at high altitude is that of accommodation or focusing of the eyes, which has been referred to in the past as "space myopia" or "empty field myopia." This is, however, not a true "myopia" or permanent shortsightedness. The expression was meant to describe the difficulty which a normal-sighted person experiences when he is trying to look at optical infinity in a visual field in which there is no visible detail, for example, the cloudless sky of high altitude. Here is a pilot searching such an empty visual field. He is trying to detect an aircraft which he knows to be some 10 or 15 miles ahead of him. He sees nothing. He keeps looking for this approaching aircraft and suddenly he sees it appearing "out of the blue" at maybe two or three miles. This is an experience which most aviators have had, although some observe it less frequently than others; but it is a perfectly normal response under the circumstances for the following reason:

When we look at something and try to bring it to a clear focus, we do so by adjusting the focus of the eye, within about one-fifth of a second, by a process of trial and error, so as to make the image as clear and sharp as we require. Thus, for example, a rapid glance at a clock face may tell us that it is approximately 20 minutes past 12 although we have not focused accurately on the numerals nor on the hands of the clock. But if we wish to know more precisely what the exact time is, we have to spend somewhat longer in focusing so as to allow the eye to make as sharp and clear a picture as it can by bringing the image (formed on the retina at the back of the eye) to as high a definition as possible. We can then not only see the actual markings of the minutes around the clock face but also the second hand, and from this we derive our more precise information.

The application of this to high-altitude flight should now begin to be apparent. If there is no detail for the eye to judge whether it is in or out of focus, there is no possibility of obtaining an error signal and, therefore, the eye will not be able to change its accommodation to the level required in order to focus on some distant object which is as yet too small to arouse attention. It is, in fact, rather like having a camera on which there is no focusing scale. The only way one can adjust the focus is to open up the back of the camera and adjust the bellows until there is a sharp picture. If you are pointing the camera at a cloudless sky, this procedure is, of course, useless.

Since the eye does not function in a way in which one can preselect infinity focus or 3-foot focus and the state of accommodation or of focus setting in the eye drifts randomly between near and far focus, on an average the normal eye is most likely to be focused for a distance of one or two meters. In practical terms this

means that although the pilot was looking as he thought at infinity – that is to say anything further than about 12 meters – his eye may have been, in fact, focused only at about the level of the windscreen or just beyond it. On his retina was formed a small out-of-focus image of the distant aircraft and, as this aircraft approached and as the image grew in size, eventually this still small, blurred image grew to such a size that it attracted the pilot's attention. At this stage he was then able to adjust his accommodation rapidly in about one-fifth of a second, so that apparently out of a cloudless and empty sky there appeared suddenly an aircraft some 2 to 5 miles away.

Some individuals, feeling this difficulty in focusing at infinity, may make a voluntary effort to look in the distance, but without the help of something to which the focus of the eyes can be locked, this effort to change accommodation can never deliberately result in relaxing the eyes to infinity. In fact, on the other hand, such an effort to look in the distance frequently causes accommodation to increase, so that the final point of focus may be much nearer than it would have been if no voluntary effort had been made. The sudden realization that what was thought to be a distant aircraft is, in fact, a speck on the windscreen illustrates this statement.

Thus, when searching in an empty visual field, it seems to be largely a matter of luck whether an individual focuses his eyes on infinity or not. He can with training learn to avoid the voluntary increase in accommodation and allow his eyes to relax to some extent, but he cannot, without stimulus of infinity, overcome his "empty field myopia" which makes him focus near instead of at infinity.

It is evident that some procedure or help is necessary to enable a pilot to focus at optical infinity which, as far as the eye is concerned with a pupil size of 2 or 3mm diameter, may be regarded as being about 10 or 12 meters from the eye. Looking at another aircraft, a wingtip, the ground or any distant object will cause the eyes to focus at infinity, and this focus may be retained for some 20 to 30 seconds as one then directs the gaze to the area of empty sky. It must be remembered, however, that some of us are longsighted and that, having directed our gaze onto a distant object, we are capable of throwing this out of focus so that the eyes are, in fact, focused from a point "beyond" optical infinity. When this happens we have obviously overcorrected and are just as badly off as if we were looking too near. It is consequently necessary to learn to use the eyes in searching in an empty visual field. If a distant object is being made use of as a sort of anchor for the focus point, we must look for our target aircraft in the same optical plane as that anchor point, whether it be another near aircraft in formation or one's own wingtip.

A second factor associated with vision in an empty field is that of the determination of distance and size or of relative angular velocity of an object once it has been detected. Everyone is familiar with the appearance of the moon when it is at the zenith as compared with its appearance when it is low on the horizon in the night sky. In the latter case it appears very much bigger, possibly because one sees it closely related to a background of objects of known size such as the roofs of houses and the outlines of trees. At the zenith it seems to be smaller, possibly because it has no objects of known size in close angular proximity. Likewise at high altitude, an aircraft, once it has been detected, often appears to be smaller and, therefore, further away than it actually is. Since, however, its angular velocity appears to be unchanged, it may seem to be travelling at a higher relative speed than is indeed the case. In other words, distance from one aircraft to another tends to be overestimated, especially at high altitude. ◄

Experience

We should be careful to get out of an experience only the wisdom that is in it. The cat that sits down on a hot stove lid will never sit down on a hot stove lid again and that is well; but also she will never sit down on a cold one any more.

Mark Twain

GOOD GRIEF!

THE pilot of a P-3 aircraft discovered a faulty TIT indicator just before takeoff. He taxied back to the ramp area to have it replaced. After being directed to a parking area and setting the parking brakes, he decided to leave all engines turning and have the indicator passed to the crew via the hydraulic service center (located amidships in the bottom of the fuselage).

An AE2 was assigned the task of delivering the indicator to the aircraft. His supervisor *assumed* that he would approach the aircraft from the rear, however, to the astonishment of all observers present, the AE2 approached the aircraft from the front. He then walked *between* the fuselage and the No. 2 engine (which was turning at approximately 98 percent rpm) to reach the hydraulic service center. After delivering the indicator, he turned and *retraced* his steps, to the further amazement of the observers. He was then confronted by a supervisor who demanded to know why he had taken such a hazardous route. He replied that he had never been warned about the hazards of rotating propellers. The squadron safety officer who reported this incident added the comment, "Good grief!"

This is only one of several recent reports which indicate that some individuals are not sufficiently aware of the hazards connected with rotating props and helo blades. A study by the NAVSAFECEN covering the period FY 1964-70 reveals that there were a total of 42 deaths or injuries caused by rotating props and helo blades.

An analysis of these mishaps revealed that negligence, lack of attention or lack of awareness was present in every case. A number of mishaps occurred because of simple negligence, i.e., personnel involved knew the props or blades were turning but attempted to move between the props and the fuselage, or otherwise attempted to perform necessary functions in a hazardous and unauthorized manner. In many other cases, afloat and ashore, aircraft handling personnel walked into propellers from the rear because of inattention or failure to realize the blades were turning. A particular hazard appears to be turboprop aircraft which may not produce any propwash to the rear when operating in *ground idle.*

Fatigue is also believed to have been a factor in some of the mishaps but this is difficult to prove. Nevertheless, it is a well known fact that the physical and mental efficiency of personnel will decline when they are overtired.

The NAVSAFECEN recommends that each activity implement a planned program of intensive education and training to reemphasize prop and helo blade hazards. Lectures, posters and warning signs are a first step, but it should be noted that these alone will not necessarily alter unsafe habit patterns. Supervisors should take the lead in making on-the-spot corrections of unsafe habits, e.g., walking through the arc of a stationary prop. Equally important, all hands (pilots, aircrewmen, maintenance men and flight deck personnel) must assume the role of their brother's keeper and actively support safe practices in this regard. ◄

Propeller/Helo Blade Mishaps
FY 1964-70

Type				*INJURIES*				
Mishap	*Total*	*Day*	*Night*	*Ashore*	*Afloat*	*Fatal*	*Major*	*Minor*
Prop Blade	39	15	24	13	26	12	21	6
Helo Blade	3	3	0	3	0	3	0	0
Totals	42	18	24	16	26	15	21	6

USE THEM!

illus 18-20

THE FIRST step in developing and adapting special training methods and devices in the United States was initiated by the Navy Department on 30 April 1941. At that time Rear Admiral J. H. Towers, then Chief of the Bureau of Aeronautics, issued a memorandum creating a special devices desk in the Bureau's engineering division. (For the past 25 years the program has been under the direction of NTDC [Navy Training Device Center].) Since that rather modest beginning, the development, procurement and use of flight simulators has grown steadily until today there are hundreds of them in operation with a total value of nearly 500 million dollars. Why this brief rundown on the historical background of flight trainers? Simply to reemphasize to

present day aviation personnel, the number of years special devices have been used to train Navy pilots, aircrewmen and support personnel. As an example, what World War II naval aviator doesn't remember the hours he spent in the old Link trainer?

One would normally conclude that after almost 30 years of doing business, flight simulator training would be highly sought after by all flight personnel. Unfortunately, this is not the case. The Training Command and fleet readiness training squadrons have established simulator usage requirements, however, pilots in many fleet squadrons are not making full utilization of available trainers. Those fleet pilots queried offered many reasons, some of which were:

It doesn't *fly* like the aircraft.

It causes pilots to learn wrong *procedures.*

It only simulates *some* of the procedures.

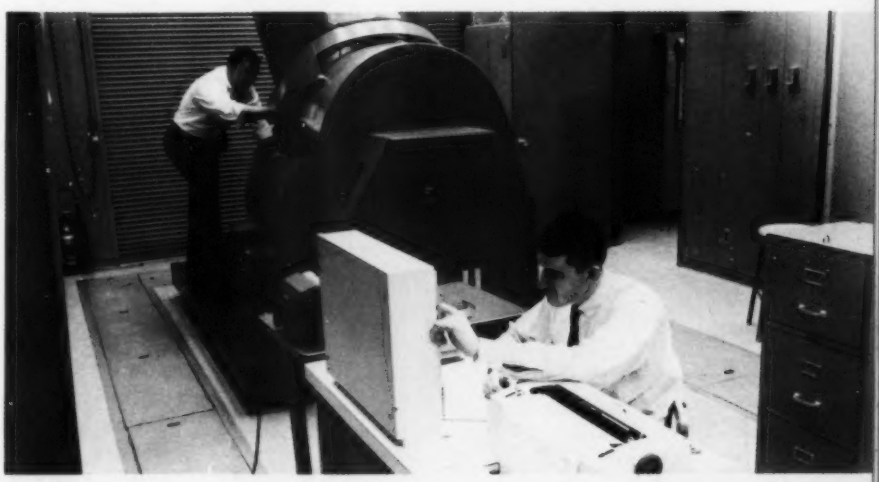
It doesn't have proper *cockpit* configuration.

It's *always* down.

There is little doubt that, as they apply to certain trainers, some of the reasons cited above are quite valid. If an aircraft has had a large number of configuration changes which are not incorporated in the appropriate simulator model, then the training received from the simulator could be more harmful than beneficial to a pilot. There are also times when the lack of qualified trainer maintenance personnel and parts have kept simulators in a down status for excessively long periods of time. However, the one about the lack of trainer availability is not completely supported. There are few trainers which are fully utilized. This is documented by the monthly simulator utilization report. Many OFTs and WSTs which could offer pilots much in the way of emergency procedure training are receiving only token use. This condition exists in spite of the fact that each year many mishaps occur which are caused in whole or in part by pilots who fail to follow prescribed emergency procedures.

During the period 1 July through 30 September of 1970, NTDC conducted a study to determine the extent to which fleet pilots (excluding those in readiness squadrons) use simulators for refresher training in emergency, flight and navigation procedures, and to identify basic characteristics of how this training is being performed. Basic utilization data was obtained from the monthly Training Device Utilization Report – Aviation Supplement. Although the information gathered is not considered conclusive, it does offer some interesting facts:

- The annual rate of simulator use per pilot varies considerably among different type operational squadrons. The range is from 1.7 hours in VAW to 15.4 in VP.
- Overall, pilots in VF, VA, VP, VS, HS, RVAH and VAW squadrons are using simulators at the rate of six hours per pilot per year. This accounts for 26 percent of the utilization of major OFTs and WSTs.
- Pilots in VF, VA and VAW squadrons use flight simulation least, averaging 2.3 hours per pilot per year. Pilots in VP, VS, HS and RVAH are the major users, averaging 10.6 hours per pilot per year.
- Practice in emergency procedures and related flight skills makes up about 50 percent of total simulator use in ASW type squadrons and 85 percent in all other types.
- ASW type squadrons man 79 percent of their flight simulator time with qualified instructors on the operational systems. In contrast, VF and VA squadrons man 23 percent of their flight simulation training with qualified flight instructors.
- If all pilots in the various squadrons mentioned above were to conduct emergency procedures training one hour per quarter, such training could be accomplished using existing devices at essentially no



increase in operating cost.

America's domestic air carriers have recognized the value of flight simulators. By 1971 some airlines were conducting 90 to 95 percent of their pilot training using this method. It's easy to understand why. The hourly cost to train pilots in a simulator is $300 to $400 as opposed to $2800 in a Boeing 707. The airlines have also found that flight crews tend to be more proficient and safety oriented as a result of their simulator time.

Flight simulation training in the Navy is here to stay and to grow. From the standpoint of economy, safety and proficiency, no other type of vehicle can offer aircrew personnel more effective training. There is good reason to believe that many of the deficiencies which now exist in the use of simulators will soon be alleviated. For instance, a preliminary meeting was held in Washington, D.C. in December of last year to investigate the various problem areas relating to flight simulation. Representatives from the Chief of Naval Operations, Commandant of the Marine Corps, Naval Tactical Doctrine Activity, Naval Safety Center and the Naval Training Device Center were in attendance. It is expected that future meetings will be convened and, from them, a clearly defined flight simulation program will be developed. In support of this, we would like to suggest three basic requirements needed to make the use of flight simulators more effective:

- *Hardware* – Procure the trainer with the aircraft. In the design phase of an aircraft contract, determine trainer requirements and configuration along with the aircraft. At the same time, establish the number of trainers needed in relation to the aircraft purchase. Make configuration control changes for trainers simultaneous with aircraft changes. In other words, no aircraft change would be made unilaterally *without* a trainer change.
- *Software* – Set up a NATOPS *type* publication for use with the trainer. The same group of review personnel would update the aircraft NATOPS and the trainer NATOPS. Establish early in the procurement cycle the parameters for which the trainer program can replace flight time, supplement flight time or have no effect on flight time.
- *Command Attention* – Place realistic requirements on the use of trainers for squadron, reserve, proficiency and other pilots who need to use the trainer. Establish an IFARS addendum to maintain an individual record of simulator utilization. Use instructors who are currently qualified in the model aircraft simulator being used.

The naval aviation community must have a better understanding of the importance of the flight simulator program in relation to overall training. As new and more complicated weapons systems are developed, so in turn will flight simulators be developed to match them. However, no matter how sophisticated these trainers may become in duplicating aircraft procedures, motions and visual effects, their usefulness as a training vehicle is largely dependent upon the acceptance they receive from the users. The best way to encourage aircrew personnel to exert a positive attitude towards flight simulation is for commanding officers to demonstrate, by example, their acceptance of them. Those who do will have flight personnel who are better trained and more safety-oriented. ◄

The Broken Brake

THE PILOT commenced takeoff roll and as the A-4 aircraft accelerated to 125 knots the port main tire blew. Takeoff was continued and once the *Skyhawk* became airborne the pilot decided to continue the flight.

After the mission was completed, the pilot returned to the airfield and elected to execute a roll-in morest landing. The aircraft touched down about 500 feet short of the north morest, however, a yielding element which raises the cable off the runway was not in place and the tailhook skipped over the cable. The *Skyhawk* continued down the runway with hook extended and engaged the south morest located some 6500 feet from the approach end of the duty runway. Once out of the gear the pilot taxied the aircraft onto the high-speed turnoff and after traveling about 75 yards he brought the aircraft to a stop and shut down. Squadron ground crew personnel arrived and put wheel chocks in place, installed ejection seat safety pins and then changed the port tire. (Note: At the time the tire was being changed, several pieces of metal were observed to fall from the port main wheel assembly. Ground crew personnel ignored this and installed the port tire without further investigating the condition of the brake assembly.)

After the tire was changed, the decision was made to taxi the aircraft back to the squadron line vice towing it because of the distance involved (about five miles). The A-4 had taxied approximately one mile and was abeam the air freight terminal when smoke was observed to be pouring from the port brake. The ground crew, following behind in a jeep, tried to warn the pilot of the situation but before anything could be done the aircraft veered to the right. The pilot attempted to correct the right turn by applying left brake but there was no response and the aircraft continued heading off to the right. Realizing that the aircraft was going to leave the taxiway, the pilot secured the engine and at the same time applied full right brake in an attempt to set up a ground loop. Unfortunately, the starboard wingtip struck a passenger boarding ramp and shortly thereafter the port main landing gear and nose gear entered a sandy area and began to sink. This, coupled with the aircraft's inertia, caused the A-4 to roll inverted. Several personnel at the air freight terminal assisted the uninjured pilot in exiting the aircraft. The accompanying photo shows the results and the substantial damaged received by the A-4.

The accident board concluded that many cause factors contributed to this ground accident. These cause factors are detailed below:

Material failure – Disintegration of the port brake pucks.

Other personnel (maintenance) – Failure of line personnel to properly change the wheel assembly in accordance with the MIM, part of which requires that brake pucks be inspected to ensure that they are properly positioned.

Other personnel (supervisory) – Failure to conduct a QA inspection after the port wheel assembly had been changed.

Pilot – Causing abnormal stress to be exerted on the port wheel assembly by making a roll-in morest landing instead of a fly-in type and by not executing a waveoff after missing the cable. In addition, excessive taxi speed more than likely caused the aircraft to overturn.

There were a number of errors committed in this mishap. A lot of people did a lot of things wrong. Nonetheless, the fact remains, if line personnel had checked the port brake assembly in accordance with the MIM, no mishap would have occurred and an estimated 2000 man-hours of repairs would not have been necessary to put a bent bird back into flight status.

It sure hurts to have to remind *maintenance* personnel that when they observe pieces of metal falling from an aircraft wheel assembly or *any other* part of an aircraft it indicates that something is amiss, to say the least. Tell you what, help stamp out preventable accidents and we'll forget we said it. ◄

Survival Pro

SOME survivors are defeated by such procedures as releasing koch fittings, getting away from parachutes and boarding liferafts. Not so the pilot in this story. In spite of a broken right arm and torn ligaments in his right knee plus the shock of a high-speed ejection, he managed to cope with his survival problems like a real pro.

Material failure was the most probable cause of the chain of events necessitating the pilot's and RIO's ejections. Speed of the *Phantom* at the time of ejection was 450 knots, 50 knots above the F-4B NATOPS maximum recommended airspeed for ejection. Although aware of his speed, the pilot judged that the nature of the emergency required immediate ejection. The investigation board backed his decision up, being of the opinion that in any emergency of this nature the pilot ultimately must rely on his instant analysis of the situation.

So much for the background. Now to the actual survival situation . . .

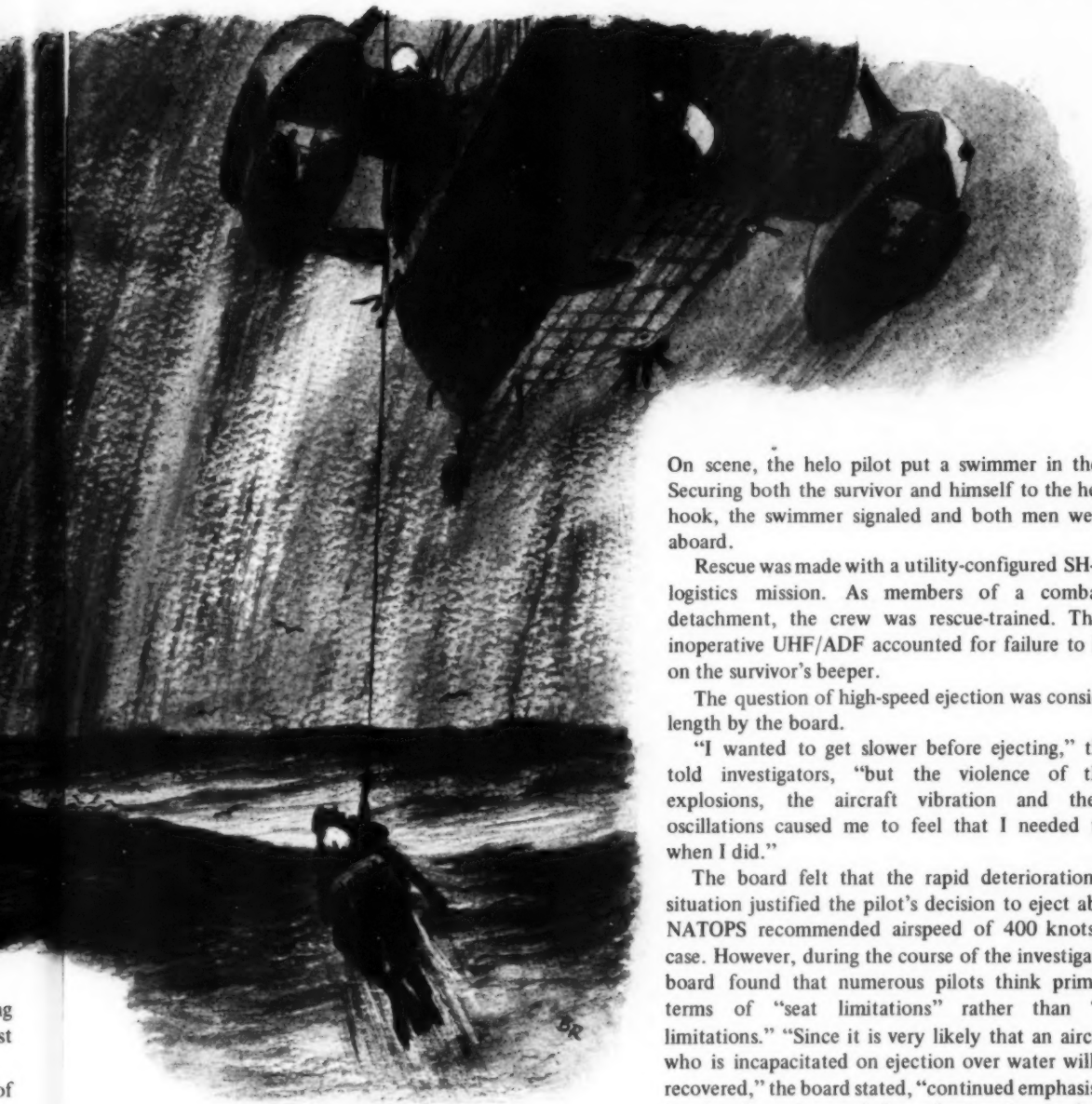
The BARCAP (barrier combat air patrol) flight in which the F-4 was flying wing had made a descent to 5000 feet at full military power. A minute or so after the *Phantom* leveled off there was a violent explosion with pitch oscillations. Initial pitch tendency was nose down but it felt to the pilot as if the aircraft tail was rising. *(The board did not exclude pilot-induced oscillations as a contributing factor here. – Ed.)* He immediately retarded the throttles to idle to investigate. Within five seconds of the first explosion, a second explosion took place, accompanied by pitch oscillations severe enough to give the pilot tunnel vision and temporarily black him out.

"The instruments were the next thing I remembered," the pilot recalls. "The aircraft was shaking so much that the only thing I could see were one or two bright lights."

The pilot was on cold mike so over the UHF he broadcast, "(Call sign), Eject! Eject!" He waited approximately one second, then pulled the alternate firing handle. *(The aircraft had Airframe Change 307, the command ejection system, installed.)* By this time, the aircraft (at idle power) had decelerated to approximately 450 knots. After pulling the alternate firing handle, he heard a loud "pop" which he assumed was the RIO's canopy leaving. His own canopy jettisoned and the next thing he remembers is floating down in his chute. He lost his helmet in the windblast and sustained "brush burns" of the face.

"My right arm was useless and there was a feeling of pain in my right leg. I looked around and saw the RIO above me in his parachute. I didn't see him move but as far as I could tell he appeared to be in good shape. *(The pilot of the lead aircraft watched both parachutes descend to the water. The RIO was hanging limp in his harness. He was not recovered.)*

"Prior to hitting the water I inflated both sides of my Mk-3C life preserver with my left hand. After I hit, I detached my parachute koch fittings with my left hand and spent about 15 to 20 seconds getting rid of shroudlines. I could not deploy my seat pack because of my broken right arm, so with my left hand I undid my left rocket jet fitting, rolled over to let the seat pack



float and deployed it. I kept pulling the line until the liferaft inflated."

Since the pilot was unable to use either his right hand or right leg, getting into the raft took an excruciating 10 minutes.

After resting a short time, he took out his PRC-90 survival radio and turned it to beeper for 30 seconds. Then he went to Guard and broadcast that he was in the water in his raft and had a broken arm and possibly a broken leg but was OK. When a helo passed overhead without sighting him, he vectored it back to his position.

On scene, the helo pilot put a swimmer in the water. Securing both the survivor and himself to the helo hoist hook, the swimmer signaled and both men were lifted aboard.

Rescue was made with a utility-configured SH-3A on a logistics mission. As members of a combat SAR detachment, the crew was rescue-trained. The helo's inoperative UHF/ADF accounted for failure to home in on the survivor's beeper.

The question of high-speed ejection was considered at length by the board.

"I wanted to get slower before ejecting," the pilot told investigators, "but the violence of the two explosions, the aircraft vibration and the pitch oscillations caused me to feel that I needed to eject when I did."

The board felt that the rapid deterioration of the situation justified the pilot's decision to eject above the NATOPS recommended airspeed of 400 knots in this case. However, during the course of the investigation the board found that numerous pilots think primarily in terms of "seat limitations" rather than "human limitations." "Since it is very likely that an aircrewman who is incapacitated on ejection over water will not be recovered," the board stated, "continued emphasis should be placed on the need for reduction in speed prior to ejection in all but out-of-control situations, *especially* those over water."

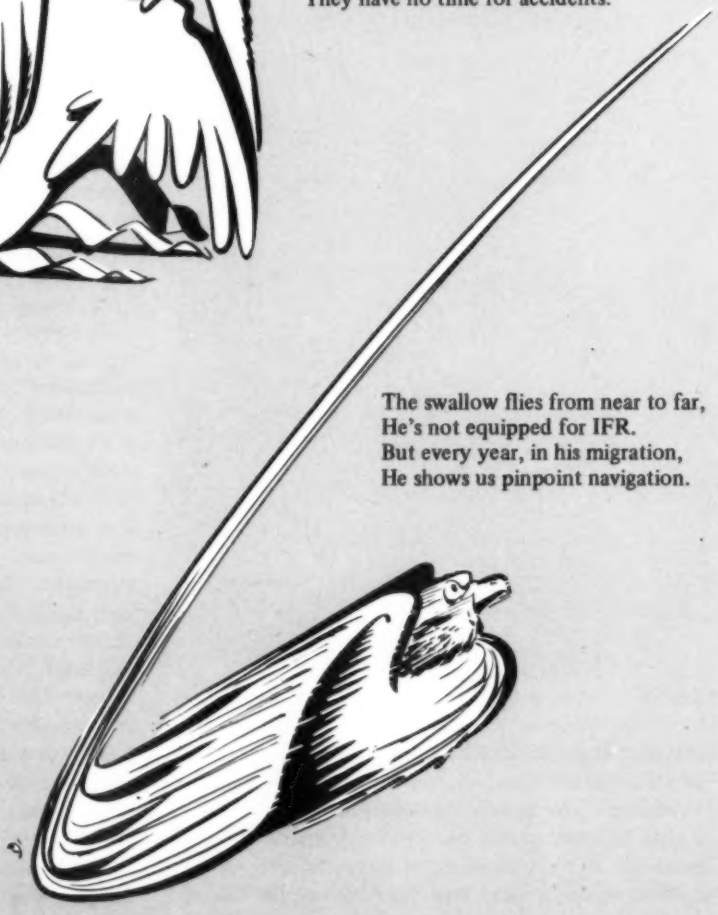
A final note: The pilot of one of the SAR helos reported that his job was made more difficult by trash dumped from destroyers in the area. He recommended that all ships involved in a SAR effort refrain from dumping trash in search areas. An endorser agreed, noting that dumping trash and garbage by surface units in a SAR area is poor headwork. All ships in a SAR area should be notified that SAR is in progress and each ship should insure that dumping of trash and garbage is *immediately and positively secured.*

THE REAL PROFESSIONALS

Once again our message features
Skills of nature's winged creatures.
With competition so intense
They have no time for accidents.

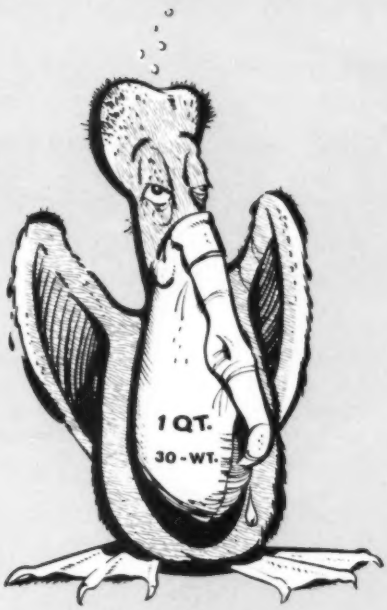
The termite isn't very nice.
He'll eat your house up in a trice.
But swarms of termites on their mission
Never have mid-air collisions.

The swallow flies from near to far,
He's not equipped for IFR.
But every year, in his migration,
He shows us pinpoint navigation.



The falcon's blessed with blinding speed,
A high-performance bird indeed,
But flat-out flight to slowest crawl,
You'll never see a falcon stall.

Delivering babies is his mission,
The stork's a flying obstetrician.
For every cargo, wee and bare,
He plans his flight with extra care.



A pelican's bill will hold a quart.
He's not an intellectual sort.
Nonetheless his instincts teach
He's much too bright to buzz the beach.

The vulture, waiting in his tree,
Consumes things most unsavory.
But though he smells a trifle sour
He has no problems with his power.

The owl is wise, of serious mien,
On flying safe is very keen.
One rule on which he's extra staunch,
The owl will never drink and launch.

Another thing about the owl,
He's really quite a modest fowl.
Though he will not his own horn toot,
For safety's sake he gives a hoot.

LT Norman E. Lane, MSC, USN

EXPEDIENCY

illus

26-30

ex-pe-di-en-cy: HASTE, dispatch – the cultivation of or adherence to means and methods which are opportune or temporarily advantageous as distinguished from those that are right.

This definition is sufficient in itself to make expediency unwelcome in naval aviation. Consequently, you seldom ever hear anyone advocating anything "for the sake of expediency." However, the practice of expediency does creep into daily operations and costs naval aviation dearly in terms of safety and readiness. The reasons for this vary but foremost is the fact that expediency comes in a variety of disguises and is often difficult to recognize for what it is.

Disguise No. 1 – *The Impulse*

Expediency shows up regularly disguised as a great idea, a sudden inspiration or, in more everyday language, as an *impulse*. This is the same feeling which moves scientists to shout, "Eureka! I've got it!" This feeling may be welcome in a laboratory but in the business of flying it is most *unwelcome*. Acting on impulse – either your own or someone else's – may produce a short-term gain but it could also have a tragic aftermath. To illustrate:

An A-6 pilot was on an ORI cruise off the southeast coast of the United States. He was scheduled as the flight leader of a two-plane section of A-6s for a simulated strike at an inland target. The target was in a lake which also happened to be a favorite fishing spot for local residents. After arriving in the area and obtaining clearance from the target control center, the A-6 pilots proceeded to visually clear the target before making their runs. Several small boats were spotted in the immediate target area. After repeated passes all but one of the boats departed the area. The target controller was notified of the problem whereupon he promptly advised the flight leader to "drop a Mk-76 alongside him to see if that will move him." Fortunately, this impulsive advice fell on deaf ears. The flight leader rejected it with a curt "negative" and continued to make dry runs until the boat finally departed the area. The A-6 pilots then completed their mission as briefed. As the flight leader later observed, it would have been expedient to follow the controller's advice but any gain achieved thereby would most certainly have been of a temporary nature. The ultimate cost might have been outrageously high.

Disguise No. 2 – *The Easy Way*

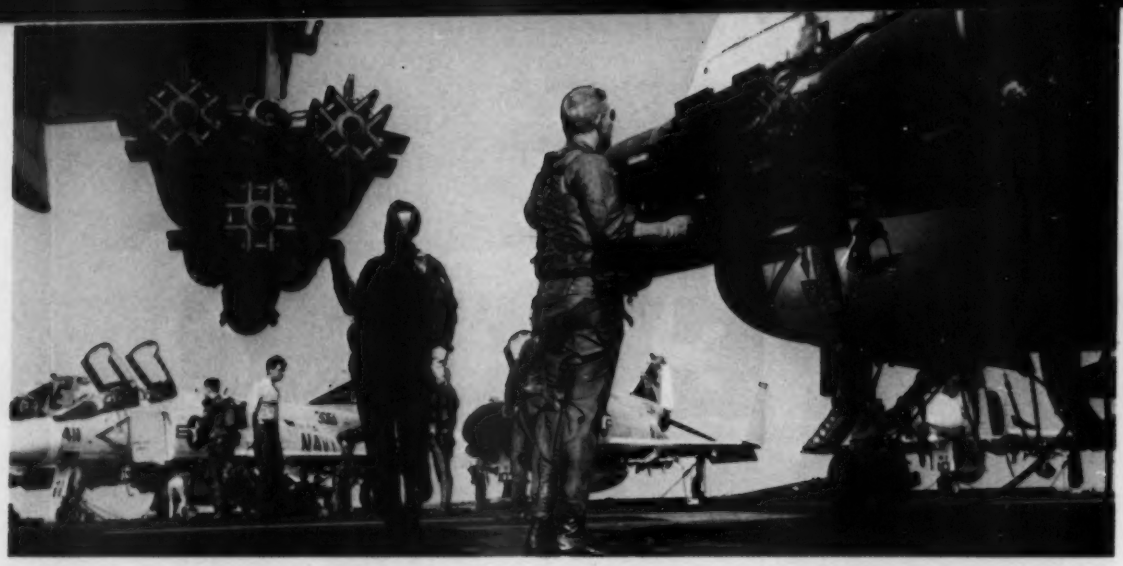
Expediency often shows up disguised as the *easy way* to do things. Expediency is aided and abetted in this deception by complacency. Examples of the unwary getting sucked into doing things the easy way instead of

the right way are abundant. They include:

(1) The unlicensed driver who undertakes operation of a piece of GSE equipment in order to start an aircraft without delay.

(2) The maintenance supervisor who permits an aircraft to be moved without the required wingwalkers and brake riders.

Continued



(3) The maintenance man who performs an intricate maintenance task without reference to the MIM.

(4) The pilot who rushes his flight planning or preflight so as not to delay the flight.

A more specific example of the hazards of attempting to do things the easy way instead of the right way involved both a pilot and a plane captain. An F-4B was started, pretaxi checks completed and the plane captain attempted to remove the chocks. However, he discovered that the port chock would not budge. This situation resulted from the fact that maintenance personnel had recently changed the port tire and had lowered the tire in such a way as to make chock removal difficult, if not impossible.

The plane captain surveyed the situation and decided to have the pilot taxi *over* the chock. At the plane captain's direction, the pilot added excessive power to move the aircraft. Not only did this attempt fail but the resultant jet blast caused considerable damage to an F-4J positioned on the line to the rear.

Many shortcuts are attempted without any deliberate, wrongful intent on the part of the people involved. On the contrary, these individuals are, for the most part, sincere in the belief that a real, permanent gain in time or effort will result. Being optimistic by nature they are able to discount the knowledge that similar shortcuts have led to trouble in the past and rationalize that "it can't happen to me." And they may be right, too – up to a point. A given individual may be able to take a shortcut many times without suffering the consequences (although this is not certain). But, at best, this is a provincial view. When the broad view is taken it is easy to see that naval aviation is sufficiently large, that there is likely to be an immediate catching up of the law of averages when shortcuts are practiced on a widespread basis. It's a simple matter of exposure.

The Master Disguise

Damage caused by expediency disguised as an *impulse* or the *easy way* to do things is relatively small potatoes compared to the damage it does in its master disguise – the "can-do" spirit. At one time or another, the practice of expediency in the name of "can-do" has led to a host of problems, including:

(1) Uncontrolled cannibalization.

(2) Flying aircraft with major discrepancies.

(3) Failure to perform required functional checks upon completion of maintenance.

(4) Overscheduling of pilots.

(5) Inadequate mission planning.

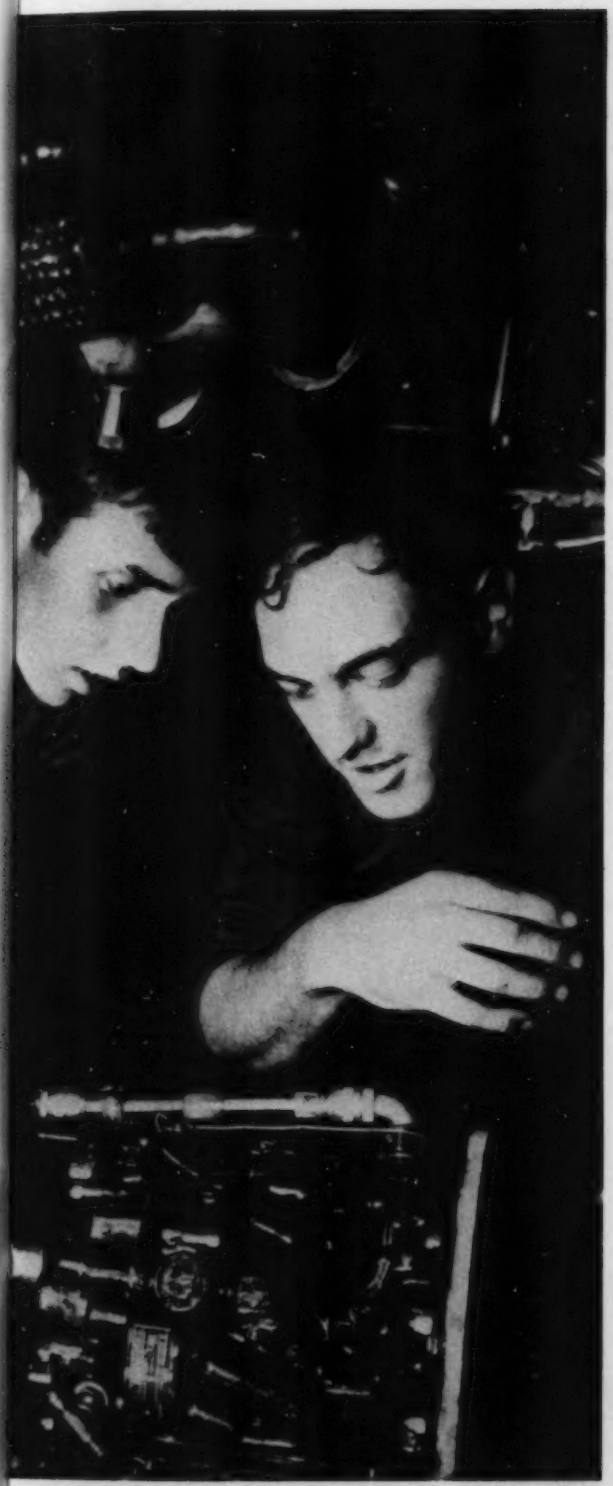
(6) The continuation of marginal pilots in stage.

(7) The disruption of effective training programs.

These problems come about not because the individuals involved do not care but rather *because they do care*. They care about getting the job done.

It is difficult to pin down the exact process by which conscientious and capable men get sidetracked into the practice of expediency but there is no doubt that it is an *insidious* process. Major General R. G. Owens, Jr., the former Commanding General of the Third Marine Air Wing, writing in the January 1971 issue of the 3rd MAW *Safety Review*, analyzed the process in some detail. He wrote:

"A review of the seven major and one minor aircraft accidents which have occurred so far this fiscal year discloses, among other things, that in three of these accidents the aircraft involved were being flown with deferred discrepancies. Although these were not in any of the three cases the primary or even the proximate cause of the accident, they were nevertheless in each case part of the chain of contributing factors which culminated in the loss of two aircraft and substantial damage to a third.



"Of course, the immediate comment can be made that 'the crew should not have accepted the aircraft,' or 'maintenance control should not have released it.' But is this really the whole story? Isn't what your crews are willing to accept and what your maintenance control releases for flight a reflection of the standards and priorities set by the unit commander and the degree to which these standards and priorities are adhered to by unit supervisors?

"When operations and maintenance are squeezed by external pressures such as administrative and material inspections or holiday routines, you have to compromise. If you compromise your schedule, you produce less output (quantity). This is a hard and unpopular compromise to make. So the desire to maintain output may tempt you to borrow on the future – in other words, to support this week's schedule with next week's maintenance. The only way you can do this is to compromise standards (quality).

"There are two reasons why this is counter-productive. First, you run the immediate danger of something getting away from you – of a malfunctioning or NFE (not fully equipped) airplane getting into a situation where failure or non-availability of the 'deferred' or 'awaiting parts' system results in an emergency which culminates in an accident. Second, what you borrow you have to pay back, and some more besides. Carrying this week's 'gripes' doesn't mean just twice as much work next week – it means three or four times as much work, and invariably the interest has to be paid from your output. So you end up having to compromise next week's schedule anyway, and you lose more output next week than you save this week.

"We don't expect you to ground every airplane for every writeup. We know you can and do defer items not essential to the assigned mission. What we do expect is that you not try to perform the mission without necessary mission-essential equipment. Remember, you can't get something for nothing, in this business or any other business. If you try, you may well lose something – or someone."

The Ultimate Cost

The practice of expediency (by whatever name) carried to extremes, can ultimately lead to the loss of lives and material resources without an adequate compensatory gain. One of the most tragic examples on record involved the OIC of a US-2C detachment. This officer accepted an aircraft from PAR with an inoperable port generator. In lieu of having the generator repaired prior to departing the PAR facility, he elected to fly it to an intermediate station for repairs. The flight to the station was two and one-half hours duration, all of which was after dark. In addition, over two hours of

the flight were conducted under actual instrument conditions. Upon arrival at the station, he attempted to have the aircraft repaired but the station was unable to effect the repairs within the desired time limit. He therefore departed the station for home base. The next leg of the flight was six hours, all of which was flown at night, with five hours being flown under actual instrument conditions.

Upon arrival at home base, the aircraft was placed in a down status for a generator change. A new generator was installed but it failed when the aircraft was turned up. It was determined that the aircraft had internal wiring problems causing the generator to short.

The OIC, over the objections of his maintenance department, placed the aircraft "Up for VFR flights only" until another generator could be installed. Subsequently, the OIC flew the aircraft on a carqual period, departing home base, without a generator on the port engine (a blank-off plate was installed).

The aircraft proceeded to the ship (about 60 miles at sea) in company with three other aircraft. Enroute, the starboard generator failed and eventually all electrical power was lost when the battery was depleted. The aircraft landed aboard ship, shut down and the OIC inquired about repairs while the other three aircraft continued carquals. He was informed that a generator change was necessary and after some delay, while attempts were made to locate a generator, he was advised that the work could be completed in about two and one-half hours. The OIC decided this was too long to wait and elected to return to home base for maintenance rather than have the repairs done aboard ship.

Incredibly, the OIC then *took off from the ship at night* (10 minutes after sunset) *with no electrical power in the aircraft*, knowing at the time that he might encounter IFR weather enroute to home field, over 100 miles away. It was his intention to fly wing on one of the other returning aircraft, although he did not brief the other pilots on the status of his aircraft or the procedures to be followed during the return to home base.

After takeoff the OIC joined on one of the other aircraft. The pilot of this aircraft realized that the OIC's aircraft was NORDO but was unaware of the full extent of his problem. He proceeded to lead the flight toward home. The flight proceeded without incident until about 20 miles from home base at which time IFR conditions (rain and clouds) were encountered. At about 10 miles from the field, the flight leader was switched to GCA and one mile further, GCA advised the leader to report gear down. The leader reduced power and lowered his landing gear. Shortly thereafter, he lost sight of the

OIC's aircraft. It was later determined that the OIC's aircraft had crashed into the water, fatally injuring all aboard.

Postaccident investigation revealed evidence of a malfunctioning port engine. Indications are that the engine failed and the pilot was unable to feather the prop because he had no electrical power. The primary cause of this accident was determined to have been a demonstrated lack of general air discipline on the part of the pilot in initiating/continuing flight under existing circumstances. Regardless, there can be little doubt that expediency in the guise of "can-do" set the stage.

Perspective

In these austere times, it seems that naval aviation is being called upon to do more and more with less and less. This belt tightening tends to focus attention on pressing day-to-day problems and commitments and may create a tendency to go for short-range solutions rather than gearing for the long haul. But don't be misled. Expediency is the antithesis of true efficiency. It compounds problems rather than solving them.

The "can-do" spirit is the most valuable ingredient in naval aviation. It is the stuff that wins wars. Be proud of it but don't cripple it by the practice of expediency. ◄

fDh Syndrome

MOST jobs become routine – often boring – after varying periods of time, depending on the individual. This is true more so for people in jobs that are repetitive than for professionals whose work is varied. However, even professionals, especially pilots, are not immune to the *fDh* syndrome.

This syndrome is a term frequently applied to pilots in trying to explain the unexplainable in aircraft accidents. The *fDh* syndrome is made up of equal parts of complacency and overconfidence and, to a lesser degree, poor training. For example, a flight instructor in the second or third year of flight instruction is especially susceptible. Even tailhookers and helicopter pilots can not avoid the *fDh* syndrome completely.

Webster defines complacency as self satisfaction accompanied by unawareness of actual dangers or deficiencies. Many aircraft accident boards use the term as that "state of mind" of pilots which existed prior to an accident. What causes complacency? In many cases it is the insidious repetition of a flight which lulls the pilot into permitting "things" to get out of hand – permitting a student to go too far without correction, scan breakdown on an instrument approach just when it is needed most or forgetting to use the landing checklist before landing wheels UP. In a few cases complacency can be caused by ignorance such as insufficient altitude or airspeed in aerobatics or ACM. Also it can be caused by deliberate abstention of direction – justified in the mind of the individual that the rule was not meant for him but for others.

Closely allied with complacency as part of the *fDh* syndrome is overconfidence. This cocksureness causes pilots to disregard ordinary no-go signs, supreme in the belief that they can handle any situation. This is more apt to be found in test pilots than other classes of pilots but it is not solely the exclusive province of test pilots by any means. This trait has cropped up in squadron NATOPS instructors, chief instrument instructors and standardization and evaluation pilots.

Inadequate training can be divided into two parts. The first part is the absence of a formal training program – not often found today in any squadron. The second part is a passive approach by individuals toward the educative efforts of command. Simply, it means lack of initiative or interest in maintaining skills or furthering development of new skills.

Unquestionably some of the best ways to keep the *fDh* syndrome at a minimum are to establish and maintain a dynamic training program, issue continuing personal challenges, conduct competitive exercises, provide variations in the routine and establish individual and squadron goals which are attainable.

Oh! *fDh* syndrome? See below.

EMERGENCY?

Clear the Pattern

illus 32-33

GENERALLY a pilot closing an airport to enter the traffic pattern and land expects other aircraft to be in the pattern but he doesn't expect any delays. However, there are times when the pattern is almost saturated and the tower controllers have to direct a late arrival to proceed with caution due to heavy traffic. Then, inevitably there is an emergency which fouls things up but good. When this happens there is only one course of action for those not in trouble – keep quiet, comply with the tower's instructions and sweat out the person with the emergency. This applies both to the individual on deck who wants to take it rolling before the emergency lands as well as the one who is already on final and is given a waveoff even though the emergency is still five miles out. The reasons are obvious. Just suppose you are cleared to roll and then make an abort,

or you're cleared to land ahead of the emergency and suddenly you take the arresting gear. What is the emergency traffic going to do if, in your haste, you have denied him a place to land?

In the opening paragraph we have implied that controllers have effectively cleared the area for the emergency. Let's assume for various reasons that routine operations continue after an aircraft has declared an emergency but is still 10 miles out. Elapsed time from 10 miles out until arrival at the field would be, at most, five minutes. That means the tower controller would have enough time to clear a multiple-plane flight to take off, plus a single aircraft or two, while at the same time getting a couple of aircraft in the pattern on deck and even giving GCA the OK to continue an aircraft on a low pass. In other words half a dozen flight operations could be conducted in the time available, if everything remains routine, with little apparent jeopardy to the emergency.

In the cockpit of the aircraft with problems, however, the pilot may have his hands full to overflowing. He has declared an emergency (usually stating one reason, like an engine out) but what is not known to the controller and the other aircraft on frequency is what else may be transpiring. He could be having trim problems or asymmetric-load problems or any of many other problems. In addition to those stated, this could be the first real emergency with which the pilot has ever been faced and the pucker factor could be high. All of the traffic he hears on tower frequency may be the straw to break the camel's back. Instead of concentrating on his emergency he has his train of thought interrupted by worrying about the landing traffic ahead of him or the traffic, on deck, taking off. Isn't it always when you need to refer to the checklist most that a distraction drives it completely out of mind? Finally, an additional reason for giving early waveoffs when there's an inbound emergency is to dissipate vortex or wake turbulence in the final approach path. For example, a P-3 aircraft had to secure No. 4 engine because of an oil leak. Usually this is no big deal for a P-3. There must be several three-engine landings by large multiengine aircraft somewhere in the world every day. Nevertheless, the P-3 pilot had an engine out, had declared an emergency and was cleared for a straight-in approach. The pilot was advised of GCA traffic five miles ahead. As events turned out the GCA traffic was waved off on short final and the P-3 bored in for a landing. At a point about one-half mile out, the P-3 was upset enough by wake turbulence to have to execute a waveoff. The performance of a P-3 on three engines is so good that the pilot, who experienced the turbulence, merely made a short turn around the pattern and made an uneventful landing.

Applied to another type aircraft, a similar situation might easily result in more than just a *near* mishap. Suppose the aircraft does not have a good waveoff capability, or suppose it could wave off only if altitude and distance from touchdown permitted. In this particular incident the same P-3 squadron had just recently experienced a near catastrophe where, during a three-engine landing, control problems developed.

Emergencies need to be treated just exactly as the condition implies. There should be a clear channel for exchange of information. The pattern should be controlled to prevent any traffic from conflicting with the emergency. Give the guy a chance. ◄

FLIP Changes

THE Department of Air Force, Headquarters Aeronautical Chart and Information Center, St. Louis, Missouri has notified the Naval Safety Center of the following changes to FLIP documents:

- *Positive Control Areas*: These areas within the Continental United States have been realigned. Aircrew attention is directed to the Flight Planning Document, Section II, page 76, North and South America for complete information. Future changes in the positive control area are anticipated and will be noted in Section II as they occur.
- *VOLMET*: Effective July 1971, VOLMET data has been deleted from Section III, FLIP Planning and is now available in each FLIP Supplement (except United States) under appropriate ACC/FICs and individual aerodromes. All aircrews will now have VOLMET data more available to them while flying.

Channelized Attention

AFTER return from an operational flight, an OV-10A was being taxied into the revetment area. The aircraft was given a right turn by the plane director. As the turn commenced, an AEAN was seen running towards the left side of the aircraft to retrieve a chock. He was struck by the port propeller and sustained a compound skull fracture which hospitalized him for two months.

Investigators stated that the well-qualified, experienced plane captain's attention became channelized when he saw the chock in the aircraft's path. Instead of signalling the aircraft to stop, he impulsively ran forward to remove the chock and into the propeller arc.

The squadron is continuing its flight line safety program and reemphasizing the need for constant vigilance when working around aircraft with engines turning.

To Absent Friends

THE Navy lost an F-4 on a cross-country not too long ago when the engine flamed out just short of the runway due to fuel starvation. The crew ejected successfully.

When the day began the pilot was not in the best of shape. As he told examining medical personnel after the accident, he had done some "heavy drinking" the night before. Investigators also learned that he had not used his oxygen mask continuously during the flight and that he had smoked at least four cigarettes. He had, in effect, lowered his personal ceiling. The alcohol taken on the night before, the reduced oxygen supply because of the altitude and the carbon monoxide in his blood from smoking combined to produce a state of oxygen deficiency which affected his judgment and performance. "Predictable diminution in cerebral function" was the way the investigating flight surgeon put it. This, he said, was very evident in the conduct of the flight and from comparison of the pilot's recollections with known facts about the flight as reconstructed from various sources.

"It is a proven fact that in cases of excessive alcoholic overindulgence," an endorser to the accident investigation report stated, "more than an overnight sleep is required for complete recovery." He called for commanding officers to rebrief and stress the consequences of overindulgence and to reiterate that flying while under the influence of alcohol will not be condoned.

Flying within 12 hours of consumption of alcohol is a violation of General NATOPS. Flying with any level of blood alcohol is dangerous and postdrinking depression and hangover can result in increased accident potential. It's the individual's responsibility to report any physical indisposition to his superiors and to assume flight duty

When an AN leaned against a C-2 electric starting cart, the heat from the engine exhaust outlet caused the CO_2 cartridge in his flight deck life vest to explode.

notes from your flight surgeon

only when he is fit to fly. The problem seems to be that an individual in this condition is frequently the poorest judge of his own fitness. That means that others, such as the commanding officer, flight surgeon, safety officer or schedules officer, must make sure that flight crew personnel are adequately observed and grounded temporarily when necessary. This, of course, is not easy to do when the person in question is your roommate or a good buddy. Considered in terms of potential danger, however, there's no room for sentiment. After all, that aircraft means flight time and flight pay for you, but most important, it means operational readiness. And you also might just save somebody's life – could even be your *own.*

Cartridge Explodes

"A ONE-of-a-kind accident" is the way the ship's safety officer describes this one but it could happen on any flight deck.

During flight ops an AN leaned against the starboard rear corner of a C-2 electric starting cart. As he did, the CO_2 cartridges of his flight deck life vest were directly in front of the engine exhaust outlet *which is clearly marked as a danger area.* The heat from the exhaust caused one of the cartridges to explode, knocking the wind out of the wearer and bruising his abdomen. Fortunately, the force of the explosion was directed outward without shrapnel. If the force had been directed toward the AN's body or if the cartridge had fragmented, it might have been a different story.

Keep CO_2 cylinders away from heat! This includes laundering and dryer cycles!

"Tiring and Enlightening"

SECONDS after catapult launch a pilot had to eject from an A-7. During the 15 to 20-second descent to the water he managed to release one side of his oxygen mask. On water entry he tried to pull both LPA-1 inflation toggles but missed the left one. When he surfaced, the chute was blossomed in front of him. The oxygen mask and suspended seat pan pulling at one side of his helmet kept his head low in the water and made breathing very difficult. He tried to roll on his back to facilitate detachment of his koch fittings but could not. The inflated collar lobe of his LPA-1 restricted his vision so that he had to "feel the fittings out" to unfasten them.

The pilot's legs were immobilized by entangling parachute shroudlines so that whenever a large swell came by he was unable to maneuver and was engulfed by water. Nevertheless, he finally released his seat pan and inflated his raft. By this time a rescue swimmer from the helo, followed shortly by a second swimmer, entered the water to help him. The swimmers had no shroud cutters and the pilot had dropped and lost his for lack of a lanyard. During the swimmers' efforts to cut away the entangling shroudlines with their knives, the pilot's liferaft was accidentally punctured. One of the swimmers removed the pilot's oxygen mask and the other freed his legs. Exhausted but uninjured, he was hoisted into the helo 20 minutes after he hit the water.

"The survival/rescue phase of this accident," the investigating flight surgeon stated, "points out the necessity for better indoctrination of pilots in water survival procedures and better training and equipment for rescue teams." *(Please see "SAR Crewman Training," April 1971 APPROACH. – Ed.)*

The pilot also had some comments on his survival evolution:

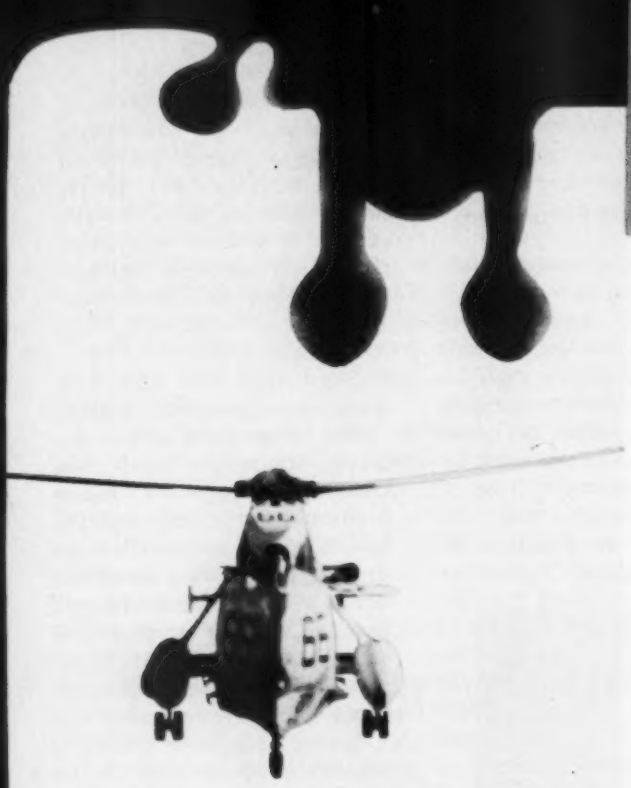
"My rescue could have gone a little smoother if I had double-checked my LPA-1 toggles to see if I had actually deployed both of them. My attention was distracted by the shroudlines around my feet. I feel that I should have had the koch fittings in hand and released them at the exact instant of water entry. My shroud cutter should have been attached to a lanyard. Then, even though I couldn't reach my feet to free them, it would have been available to the rescue swimmers. The swimmers were not equipped with shroud cutters which consequently led to the deflation of my liferaft.

"All in all, the experience was tiring and enlightening," the pilot concludes. "I feel that I have learned many things that would aid me greatly if another survival situation occurred." *(File under learning the hard way. – Ed.)*

After a Ditching

"ONCE the egress was completed, the UH-34D crew lost no time carrying out their survival procedures. All were thankful for the recent survival drills and lectures because there was no doubt in their minds as to what procedures to follow."

Squadron survival officer ◄



HELICOPTER REVIEW

1970

HELICOPTER flying is becoming safer. After a review of a bad year in calendar year 1969, reported in the June 1970 issue of APPROACH, the following statement was made: "A cursory look at the state of helicopter health in 1970 is encouraging." That is how the year turned out. The accident rate in 1970 did decrease and it was a better year than 1969. There was a reduction in the accident rate in four of seven models reviewed. Figure 1 shows the number of major helicopter accidents, flight hours and rates by model for

Flight Hours, Major Accidents & Rates

	CY 1969			CY 1970		
		*Accidents			*Accidents	
Model	Hours	No.	Rate	Hours	No.	Rate
H-1	109055	33	3.03	127801	31	2.43
H-2	32900	9	2.74	29370	2	.68
H-3	89005	8	.90	69153	10	1.45
H-34	101202	13	1.28	53234	11	2.07
H-46	155779	26	1.67	138751	17	1.23
H-53	38770	8	2.06	43811	4	.91
H-57	14506	0	0	15138	4	2.64
All	541217	97	1.79	477258	79	1.66

* Accidents involving DEA are not included.

Fig. 1

both CY-69 and CY-70. Notice that the overall accident rate was reduced by seven percent in 1970 because of a 19 percent reduction in the number of accidents. Three models which suffered increases were the H-3, H-34 and TH-57. The latter, a recent addition to the helo inventory, was introduced at Ellyson Field in December 1968 and operated accident free until February 1970.

Further analysis of the past two years is necessary to get a more complete picture. Figure 2 has been included to show a comparison between 1969 and 1970 accident totals of the various models by flight purpose and damages incurred. Helicopters which received minor or limited damage are not included. The greatest gain in safety took place in operations ashore. There was a

illus Tabs 36-39

	Number of Accidents by Flight Purpose								Number of Damaged Aircraft			
	Day				Night							
Model	Ashore		Ship		Ashore		Ship		Destroyed		Substantial	
Cal. Year	69	70	69	70	69	70	69	70	69	70	69	70
H-1	28	25	0	3	3	2	2	1	*19	*16	*17	*16
H-2	5	2	3	0	1	0	0	0	6	1	3	1
H-3	1	4	3	5	3	0	1	1	6	3	2	7
H-34	9	5	0	3	4	3	0	0	9	8	4	3
H-46	13	10	6	3	6	3	1	1	17	8	9	9
H-53	5	2	0	0	3	2	0	0	6	3	2	1
H-57	0	4	0	0	0	0	0	0	0	1	0	3
All	61	52	12	14	20	10	4	3	63	40	37	40

* There were two accidents involving multiple H-1 aircraft, therefore the number of damaged aircraft exceeds the number of accidents.

Fig. 2

considerable reduction in accidents ashore, both day and night, in calendar year 1970. However, a corresponding reduction in shipboard accidents did not take place. There was actually an increase of one shipboard accident in 1970. The columns depicting damaged aircraft is worthy of note also: *23 fewer destroyed aircraft*! This was the result of a lesser number of accidents in every model except the TH-57. That means there are 23 more helicopters available in 1971 with which to get the job done – and in terms of dollars, it represents a bundle!

A brief discussion of the causes of mishaps and the types of mishaps should provide additional information on the improved helicopter safety record for 1970. The three main causes, pilot error, maintenance error and material failure remained approximately the same, by percentage, in 1970 compared to the previous year. No trends are prominent in any of the three causes except that 1970 showed a slight improvement across the board. The most productive areas for even further improvement will be addressed later in this article. In reviewing the types of mishaps there is not quite as definitive a base as the causes. However, collisions with objects, ground and water remain high as well as system malfunctions and failures. Again, as was apparent in causes of mishaps, there was not an appreciable difference, in percentage, of accident types between 1969 and 1970.

One other area to complete the review is a comparison, between the two years, of the phase of operations – what the helicopter was doing when the accident occurred. A few mishaps occurred while taxiing and even while static, but the foremost phases of operations involving accidents were in flight, landings, takeoffs and autorotations. As one might suspect, for the in flight phase, maintenance error and system malfunctions showed up the most frequently. The other operational phases involved pilot technique, and in these phases pilot error was adjudged the most frequent cause of an accident. For the third time in comparing 1970 against 1969 results, the percentage of accidents in phase of operations was quite similar. Only one surprising element arose – an increase in 1970 autorotation accidents in several models.

Pilot-Caused Accidents

The most fertile field for a continued reduction in helicopter mishaps lies with the man at the controls. One bright spot came forth in the compilation of data for this article and that was the reduction in the number of accidents caused by NATOPS violations compared to a similar survey reported in APPROACH in March of 1969. This is not to infer that there weren't any, but the number was considerably less. There are two areas of concern worthy of comment involving all helicopter models. These are accidents caused by the apparent lack of pilot skill in autorotations and precision landings. There are far too many accidents occurring in these *phases of operations* not only in practice but also under emergency conditions. A few selected briefs (taken at random, from accident reports in 1970) are reiterated for illustration.

- The copilot terminated an approach to a VIP pad in a three-foot hover. The plane commander instructed the copilot to turn the aircraft to the right. As the aircraft turned, the tail rotor struck a basketball goal and separated from the aircraft. The pilot took the controls and landed quickly as the aircraft began to rotate. No one cleared the area before the copilot began his turn.

- While airborne, the pilot felt the aircraft yaw sharply left. He lowered the collective and entered

autorotation at 90 knots. He continued the autorotation at 90 knots, touched down at 15 knots, hooked a skid and the helo flipped over on its starboard side.

• The pilot commenced a left-hand approach to a tight landing area. His approach was fairly shallow with final approach speed of 40 knots. The aircraft settled rapidly and hit the ground on the side of a hill. Excessive, uncontrolled sink rate was the primary cause for the crash.

• As the aircraft approached the 90-degree position descending through 50 feet and 40 knots, the pilot increased power to 110 percent torque to slow the rate of descent. He was not successful and went to 140

percent torque, but the helo hit the runway hard in a left skid and wiped out the landing gear.

• When the crewman and LSE ascertained the tailwheel was safely over the deck, the LSE gave the signal to land. As the wheels touched down the main rotor blades contacted a 1MC speaker, a red floodlight and a hangar curtain cover. The pilot and LSE failed to observe objects in the landing area and to ensure rotor blade clearance.

• The copilot began a 360-degree spiral approach into the landing area. The helo turned into a long, flat final and came to a hover at the edge of the zone with about 15 knots airspeed when the aft end of the helo began to sink. The pilot was unable to regain RPM and the helo settled into a wire. A pole punctured one of the fuel cells and the aircraft burned.

• An IP was demonstrating a full autorotation, with a 90-degree flare, but did not dampen out all drift and touched down with about five knots groundspeed. After touchdown the aircraft rolled slowly right, coming to rest on its starboard side.

These briefs of autorotation and precision landing accidents have been used to provide facts for serious consideration by pilots and as "meat for the table" for APM discussions. Most helo pilots have been in situations similar to these illustrated and many can say, "There but for the grace . . . "

Material-Caused Accidents

In discussing material failures there were many instances where material failure occurred, yet it was not adjudged the primary cause of the accident. For example, a multiengine helicopter might have had an engine failure which started the emergency, but an accident which ensued might have been blamed on maintenance personnel for an improper fuel pump installation or because a pilot "blew" a landing. Nevertheless, material failures are too frequent. There were, in the two-year period, 38 engine failures and 40 instances of system failures (rotors, gearboxes, shafts and couplings). The ratio of material-caused accidents compared to the total number of accidents is similar for both 1969 and 1970.

Preliminary results for the first half of 1971 indicate that there is a continuation in improved safety in helicopter operations. A banner year may be in the offing.

Future Prospects

The various accident causes discussed can be reduced and helicopter operations made safer by *better pilot techniques* and *improved maintenance practices*. This is a broad generalization and, taken at face value, is likened to a politician saying he's for motherhood and against sin. However, *better* pilot technique is used in the context of:

- Reducing NATOPS violations
- Eliminating fast, steep approaches
- Increasing vigilance for obstacles in the approach and landing zones
- Decreasing misuse of flight and power controls
- Decreasing accidental (or careless) loss of rotor RPM
- Avoiding maneuvers which result in excessive sink rates
- Increasing the thoroughness of preflight inspections
- Improving the evaluation of wind, weather, aircraft emergencies, loads and clearances
- Recognizing your own and your helicopter's capabilities
- Avoiding downwind hovers and takeoffs
- Taking advantage of every opportunity to increase your pilot skill

Improved maintenance practices includes the entire scope of maintenance and is used in the context of:

- Improving quality assurance
- Performing work by the book (MIM, IPB and PMRM)
- Improving corrosion control
- Inspecting by the every-time use of MRCs
- Improving supervision
- Correctly adjusting fuel controls, aircraft rigging and shaft alignment
- Lubricating gears correctly
- Improving troubleshooting and eliminating the causes of repeat discrepancies
- Applying the correct torque
- Installing the correct bolts and securing them properly
- Improving the assignment of qualified personnel to troubleshoot or perform work
- Inspecting closely all turbine blades
- Completing repairs from previous damage before releasing an aircraft for flight

The above suggestions, admonitions and ideas are the results of comments in accident reports reviewed for the study period and contain a wealth of constructive ideas to decrease helicopter accidents many times over. Let's give them close attention and profit from the experience of others. Right on, rotorheads, right on!

When you get a

Funny Feeling on Final

40-42

WATCH out! You may be about to land at the wrong airport. Couldn't happen to you? Perhaps, but it *has* happened to several pilots recently and thus merits discussion!

Multipiloted Aircraft

A recent Anymouse report explains how it happened to a P-3A crew. The PPC of this aircraft had 3000 hours flight time and the 2P had 300 hours. According to the report, the PPC had great confidence in the 2P (i.e., thought he was a budding Ace) even though they had never before flown together.

At the end of the first leg of the flight the PPC allowed the 2P (in the left seat) to make the landing. The 2P rose to the occasion and greased the P-3 onto the runway "smooth as glass." Later, as they neared the end of the second leg of the flight, the PPC again allowed the 2P to fly an ILS approach and landing. The weather was VFR but hazy with about four miles visibility.

On final approach, the aircraft was slightly left of course and a tad high. The DME (tacan was located on the field) read five miles. About this time the PPC spotted a runway about three miles away and asked the 2P, "Do you have the runway?" The 2P allowed that he did but later confessed to a funny feeling at the time – a feeling that the location of the field and the reading on the DME did not jibe. Also, he noticed that the tower seemed to be located at the wrong place on the field. However, he shrugged off these feelings and concentrated on the PPC's instruction to "Get down, get down." Reducing power, he smoothly flew the aircraft down to what appeared to be a good visual glidepath. Just before touchdown, the funny feeling returned momentarily. The runway looked considerably shorter than the expected 11,000 feet. Nevertheless, the 2P continued the approach but, to be on the safe side, he

planted the aircraft on the runway a bare 20 feet past the threshold and immediately began to apply shortfield stopping procedures. This was not quite adequate, however, and the aircraft rolled off the end of the runway and onto a stabilized overrun. A lot of small stones and loose dust was stirred up but the aircraft was undamaged. Only the pride of the pilots suffered.

It was subsequently determined that the aircraft had landed at a small civilian field (runway, 3400 feet) located along the final approach course of the intended 11,000-foot long military field runway.

The author of this Anymouse report attributed this embarrasing mistake to the following reasons:

- Failure of the pilots to back each other up (unquestioning trust in the actions of the other).
- Weak DME. This was noted during the flight and led to less than complete trust in the instrument during the approach.
- Only one approach plate in the cockpit (in possession of the 2P).
- Unfamiliarity with the airport layout and insufficient knowledge concerning other airports in the local area.
- Simple complacency.

Single-Piloted Aircraft

A number of single-piloted aircraft have also been involved in unintentional landings at wrong airports. As a flight of three A-4s, on a night cross-country formation flight, neared the destination airfield, the flight leader cancelled IFR and detached his wingmen for individual VFR approaches. After being detached, one of the wingmen (who was relatively inexperienced) sighted a 5000-foot municipal field and mistook it to be the destination military field. On landing, he ran off the unexpectedly short runway, substantially damaging the aircraft. He was uninjured.

A similar incident involved a night formation flight of three A-6 aircraft. In this case, the flight leader detached his wingmen for individual straight-in approaches and the result was the same: one of the wingmen landed at a nearby civilian field instead of the military field as intended. The pilot involved describes in detail how it happened:

"I am a first-tour pilot with 500 hours total flight time and 200 hours in type. At the time of this incident, I was on a two-week deployment to NAAS Desert. I departed NAAS Desert on a routine night training mission as No. 2 man in a three-plane flight with the squadron flight surgeon as right seat observer. The sky was clear and visibility was unlimited.

"After takeoff the flight proceeded to a target facility south of the base and each aircraft made 12 ordnance deliveries. We then rendezvoused for the return flight. The other two aircraft had hung ordnance, therefore, the flight leader advised me, as briefed, to break off from the flight and enter the break for landing. He and the other wingmen would then make individual straight-in approaches. However, I requested clearance to remain with the flight and make an individual straight-in approach. This request was approved by the flight leader.

"The flight was in loose right echelon when the leader began to orbit a point about 11 or 12 miles from the field on the extended centerline of the duty runway at NAAS Desert. The other wingman was detached and the leader informed the tower that he was inbound. The leader made another 360-degree turn then detached me for a straight-in approach. As I leveled my wings, I noticed a runway dead ahead. I checked my altitude, airspeed and distance from the tacan but neglected to

notice my heading or the tacan azimuth indication. At eight miles DME I called the tower, told them I was eight miles out, then dirtied up and began a descent from 2200 feet AGL, while slowing to optimum angle-of-attack.

"Continuing inbound, I noticed the runway appeared to be closer than I expected but attributed this to faulty night depth perception. In a few seconds I realized the runway *was* very close so I reduced power and increased my sink rate. I rechecked the tacan DME and it read six miles. I remembered the tacan site at NAAS Desert was in the center of the field but as I looked at the rapidly approaching runway and the six miles indicated, I decided my memory was faulty. I was too busy flying the airplane to check the approach plate on my kneeboard.

"I was now sinking like a stone with no hope of safely landing so I waved off. I called, 'Taking a waveoff' and the tower rogered. They came up seconds later and asked why I had waved off. I replied that I did so because I was not properly set up on the approach. During the turn downwind, I climbed to 1000 feet AGL, rechecked the gear and flaps, extended the speedbrakes and at the 180-degree position reported, '180, all down, full stop.' The tower rogered and gave me clearance to land. As I passed the 90-degree position I began looking for the Fresnel Lens on the left side of the runway. I couldn't find it and thought, 'It must be broken.' I made a normal landing touchdown which was later determined to be about 450 feet from the approach end.

"During aerodynamic braking after touchdown, I realized that the three small green lights marking the far end of the runway were approaching much too rapidly. As I lowered the nose, the implications of no approach lights, no mirror and a short runway led me to the instantaneous conclusion that I had inadvertently landed on a 7000-foot runway at NAAS Desert instead of the 14,000-foot long runway which I intended to land on. I considered adding power and taking off but my airspeed, now about 80 knots, and the rapidly approaching end-of-the-concrete lights put that thought out of my mind. Instead, I increased my pressure on the brakes and dropped the tailhook, hoping to catch an arresting gear cable.

"The aircraft came to rest about 80 feet short of the bitter end of the runway. It had not caught a wire. As I looked down from the cockpit and saw the edge of the runway only a few feet away, then looked over at the rotating beacon (which was solid white and not split-white as expected) and noted the many light civilian aircraft parked on the dimly lit ramp, I realized that there was no wire to catch. I had just landed at Desert Municipal Airport instead of NAAS Desert.

"I made a UHF transmission to this effect. It was heard by my flight leader who was still airborne and by NAAS Desert Tower. The Navy tower informed me that the field I was on had only unicom and no active tower. Someone – I don't know who – suggested over the air that I turn around and fly the plane out. I vetoed this because I had no idea of the exact dimensions of the field except that it appeared very short and very narrow. The Navy tower informed me that the runway was 5400 feet long and 54 feet wide. I broadcast my intention not to attempt a takeoff. Later, I discovered the field was actually 5000 feet long.

"Turning on the taxi light, I taxied forward about 20 feet and inspected the turnoff to the ramp area. It did not look like it would support the weight of the aircraft so I decided to shut down where I was. After requesting the tower to notify our squadron duty officer and have a vehicle sent over, I secured the aircraft. No damage was done to the aircraft or to the runway. The aircraft was flown out the next morning by a test pilot from our squadron.

"I believe this incident occurred because I was relying generally on information from outside the cockpit and was not specifically familiar with the area. I never really took the time to evaluate the meaning of the aircraft's heading or the tacan azimuth indications on the HSI. I accepted a situation with too many wrong indications – incorrect DME, the odd (unexpected) layout of the field, the absence of the Fresnel Lens and wrong configuration of the rotating beacon. The alarm bells were ringing but I didn't take heed.

Discussion

The primary factor leading to landings at the wrong airport seems to be complacency. In most cases, the pilot has a number of indications that everything is not right but presses on anyway without taking the time to properly evaluate the situation. Contributing causes are (1) flight leaders who detach wingmen without insuring that they are properly oriented and (2) the fact that there are often several airports located in proximity to each other in terminal areas. Thus, a pilot may easily select the wrong airport unless he is familiar with the location of all airports in the destination area *or* takes care to follow IFR procedures exactly.

FLIP approach plates do not always depict other airports in the vicinity of the destination airfield. Therefore, a pilot bound for an unfamiliar airfield is well-advised to consult other sources of information; namely, the appropriate high/low altitude FLIP charts and terminal area charts.

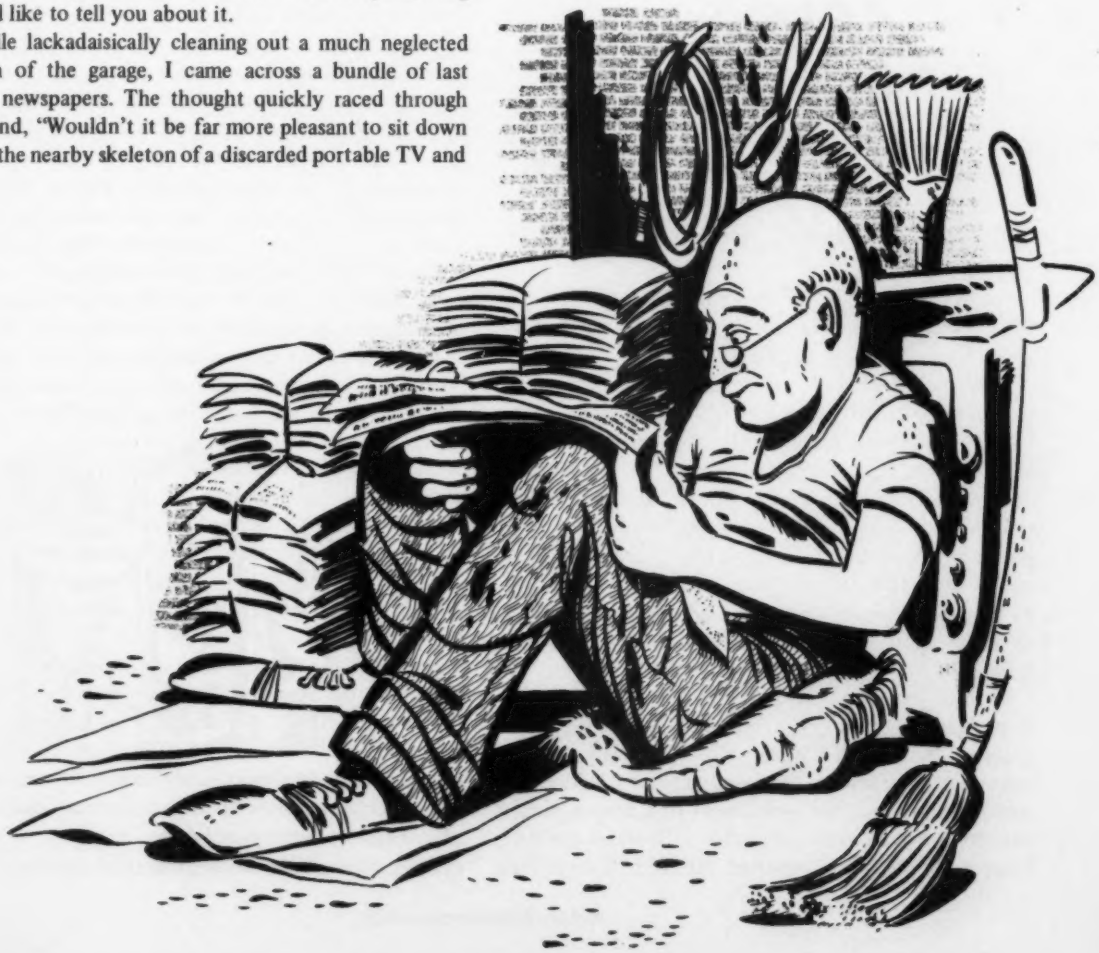
Remember – if you get a funny feeling on final . . . watch out! You may be about to land at the wrong airport. ◄

'I only know what I read in the papers.'

"I ONLY know what I read in the papers" was a memorable remark made some years ago by the late world famous humorist and sage, Will Rogers. Mr. Rogers had tongue-in-cheek when he made the above statement but, nevertheless, there is much logic to it. Unfortunately (or fortunately, as the case may be) TV provides the main source of news for the majority of people residing in this country. Yet, the capsule or digest type TV news can provide neither the detailed coverage of the big stories, nor tell unimportant offbeat stories which appear everyday in newspapers. This fact was brought to my attention one recent Saturday morning and I'd like to tell you about it.

While lackadaisically cleaning out a much neglected section of the garage, I came across a bundle of last year's newspapers. The thought quickly raced through my mind, "Wouldn't it be far more pleasant to sit down beside the nearby skeleton of a discarded portable TV and leaf through these papers, than continue the rather laborious and boring task at hand?" Being somewhat weak-willed and spineless, I offered absolutely no resistance to this idea. Enroute to the TV with papers in hand, I picked up a tattered throw pillow from the floor on which to rest my tired frame as I partook of my pleasure. While ensuring that the lady of the house was nowhere in sight, I placed the pillow aside the TV, sat down and picked up the top paper from the bundle.

After thoroughly absorbing the news from many of the papers, I realized two things – how much had been



missed during the initial reading and the number of stories describing mishaps. Some of the mishaps were routine, others were humorous, if somewhat pathetic, and a few were downright bizarre. I paused in my reading and began to muse over some of the more unusual ones I had read about.

• A 36-year-old man was killed in his backyard by an arrow that police said was shot by a neighbor practicing archery. The neighbor was arrested.

• A state senator was so concerned about a dangerous curve on one of his state's highways that he drove two state transportation department officials to the site to look at it firsthand. He made his point. As the car reached the curve it was struck by another auto attempting to pass on the inside.

• A husband and wife were riding a homemade bicycle-built-for-two. While crossing a small bridge, the bike parted in the middle. The rear section on which the wife was riding veered to the right and crashed through a wooden guardrail. The wife plummeted into the water below and was rescued by a man who was fishing under

the bridge. She received minor cuts and bruises. The husband was uninjured (at least temporarily).

• A young man not quite two years of age learned how to drive his father's car without the aid of a lesson. The father had left his son in the front seat of the car while he went back inside the house to fetch something. Unfortunately, he neglected to turn off the car's engine and set the parking brake. The youngster put the car in gear and it raced forward striking a small fence and then crashed through a 10-foot fence. The car came to rest in a neighbor's backyard. The lad took along his six-month-old twin brothers and a 12-year-old neighbor as backseat passengers. No one was injured.

• Only minutes after receiving her driver's permit from a juvenile court judge, a 16-year-old girl was back in court – but this time in the judge's chambers. She had something to report to him personally. On leaving the county courthouse, the new owner of a driving permit had struck a parked car – the judge's. "It was just a little bump," the tearful girl reported. She said, "I could find

no damage at all." Assuring her that she had obeyed the law in reporting the accident, the judge, who left the bench to hear the young girl's story, told her: "That car is seven years old, has been 85,000 miles and has been bumped before. I don't reckon one more little bump will hurt it." She was sent happily on her way by a very understanding judge.

• A 16-year-old boy was rushed to a hospital after he suffered injuries in what was described as a game of "chicken" with a freight train. Witnesses said the boy stood on the tracks and thumbed his nose at a slow-moving freight but jumped too late to avoid being hit by the leading edge of the diesel engine. He received a broken pelvis and abdominal injuries.

• A local fire chief gave 25 visiting children a demonstration on sliding down the firehouse pole after he decided it would be dangerous for them to do it. He broke two bones in his back when he landed.

• "Help me, help me," screamed the runaway as a policeman approached. It looked like the end of a 15-hour search for the wayward ward of a local couple. As the patrolman entered a residence to take charge of the runaway, he was bitten on the hand. He was sent to

the hospital for treatment and the runaway was taken to police headquarters. Records showed no charges were placed against the wayward parrot.

• A woman was hit in the right eye by a plastic

stopper while removing it from a bottle of carbonated wine. Permanent blindness resulted.

• A policeman suffered an injury to his right eye when his three-year-old daughter fired a pistol containing a blank into his face. The officer had been cleaning the .22 caliber pistol while his daughter and grandson watched. When he turned around to get something from a nearby bed, the girl grabbed the gun and when he turned back she fired the gun into his face. He stated that he thought all the blanks had been removed from the pistol after it was used the day before in a police demonstration. It was not determined whether surgery would be needed to repair the eye.

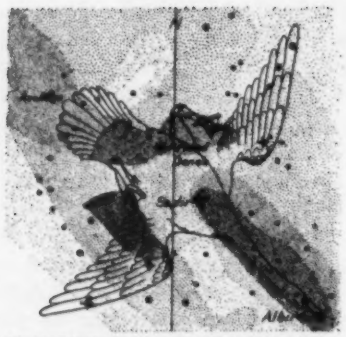
• A minor house fire which was thought to have been extinguished earlier apparently rekindled itself a few hours later, causing severe burns to a male occupant of the home. The fire official investigating the fire said the injured man had dragged a burning mattress out of the house during the early morning hours. He then returned to bed but slept in a different room. Sparks from the mattress evidently ignited a second fire which destroyed the second floor of the home. The fire was detected by a fireman on his way to work.

• A stunt pilot was killed at an air show, the sixth flier to die during the weekend in separate accidents at air races or shows. He was flying a one-seat *Bucherjungmeister*, an aerobatic plane similar in design to aircraft used by the Germans to train Luftwaffe pilots in the 1930s. Police said the pilot was killed when his biplane took a nosedive and crashed into a sand pit just beyond the airfield where the show was taking place. One spectator, a pilot for a local business firm, described the mishap this way. "He came over the field rather slow in an inverted position and I could tell right away he was going to start an inverted spin, which is a precision aerobatic maneuver. And as he started, I thought well, all the shows I've been in myself and seen around the country, he was pulling a rather low altitude for an inverted spin. He should have been at least another 300 or 400 or maybe 500 feet higher. He entered the spin and did two complete turns and I thought well, right about now he should start his recovery and when the time of 'now' came, the recovery was not started and I thought to myself, he's either not going to make it or it's going to be very close. Of course, in just a couple of seconds he was into the ground."

• A man was burned severely when repairs he was making to his home apparently caused a gas leak that resulted in a flash fire. He had driven nails into a propane gas line while making repairs to the attic of his home. Gas then drifted downward and ignited. He apparently was burned by the initial flash.

As I sat there pondering the many ways people can become involved in mishaps, my eyes made a 180-degree sweep of the garage. Good heavens, I reasoned, what a mess, a real fire hazard. Why, a lighted match in here could cause a fire of ferocious intensity. Up from your perch, dullard, and get about the business at hand.

Unfortunately, before this action could be taken, an authoritative voice from the rear bellowed forth, "What are you doing sitting there reading those papers, loafer?" It was the lady of the house. Somehow or other, in her notoriously sneaky manner, she had managed to infiltrate the area, undetected, and catch me at the idle. This causes her adrenalin glands to operate at max power. Not wishing to be identified in tomorrow's edition of the newspaper as one of yesterday's unusual accident victims, I quickly arose and picked up the broom. Someday, I thought to myself as I manipulated the broom at *roadrunner* speed, I'll show her who's boss around here. ◄



The Constellation Cygnus.—From Ptolemy's description.

Letters

God grant liberty only to those who love it, and are always ready to guard and defend it.

Daniel Webster

Out "Geesed" By the Controller

Los Altos, Calif. – Navy acronyms have always thrown me for a loss, so I'm hoping that I hit on the right combination in the address.

An interesting sidelight of the *Corsairs* in Korea (ref. May '71 APPROACH) is the story of an Air Force "retread" intercept controller and a Marine "retread" F4U-5N fighter pilot. In the fall of 1951, the two retreads collaborated in trying to shoot down a pesky PO-2 (speed 70 knots approx.). Undoubtedly we both had visions of a WW I type victory – sort of like a Fokker Flamer. After considerable gyrations in the black sky from Wonju (K-46) to Kangnung (K-18) we called it off as a bad deal.

As the intercept controller, I sent the F4U-5N back to base for refueling while I continued, very meekly I might add, tracking the flight of geese as they flapped on down the east coast toward Pusan.

Don Weiler
Controller
Oakland ARTCC

P.S. – Personal note to CDR BORDELON –

Please accept my tardy congratulations on a fine exhibition of straight shooting and cool flying. I had heard of your victories but assumed you were a Marine since they flew the F3D and the F4U-5N earlier in the police action. My intercept duties were with Bromide control, however, I believe Dentist control may have controlled your intercepts. Call signs change of course, but both squadrons were under USAF 502nd AC & W Group.

● We certainly appreciate your taking the time to write and share with us the humorous attempt of an intercept on the geese. Although it was chopped from the original article because of space limitations, CDR Bordelon recounted an intercept in which the bogey was being tracked at *zero* groundspeed. Imagine his surprise when the bogey proved to be a hovering helicopter!

Times have certainly changed since you directed aircraft under the call sign of Bromide way back in the early fifties.

But, while your controlling today is far removed from combat intercepts, it is no less important. The expertise exhibited daily by you and all those who man the ARTCC circuits is certainly appreciated by us military types who must fly the congested airways within CONUS.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Aviation Safety Slogans

FPO, San Francisco – I am attached to VA-212, the *"Flying Eagles,"* embarked in USS HANCOCK, currently on her sixth Vietnam deployment. I want to add that I am proud to be associated with both VA-212 and the HANCOCK.

Safety is of primary concern to any attack carrier, especially during flight operations. After reading an article on safety recently, I decided to make a personal contribution. As Operations Yeoman, one of my duties is the typing and distribution of the daily flight schedule. I thought it might be a good idea to compose a few safety slogans and print one at the bottom of each daily flight schedule. Here are two examples:

A tanker is boring
It's really not fun,
But fly it safe
And the job will get done.

On the way to your bird
Down the flight deck you trod,
Keep your eyes wide open
And pick up the FOD.

My slogans have been well received by squadron pilots and they are now a regular feature of the flight schedule.

AN Dennis R. Thomas, USNR
VA-212

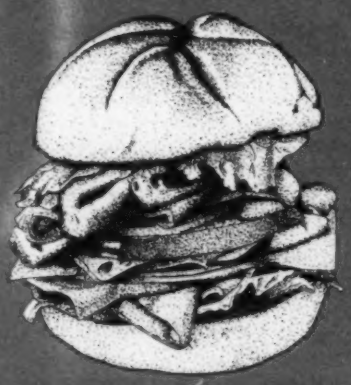
● As we are often wont to say, personal participation by all hands is the key to safety. We are pleased to recognize your contribution. Keep up the good work.

Uncoordinated Clearance

McChord AFB, Wash. – Recently, my aircraft (a C-141) was cleared to land at a naval air station by a GCA final controller. The pilot informed the controller at that time (while at 600 feet) that there was another aircraft on the runway. At 300 feet, the GCA controller again cleared the C-141 to land. However, the other aircraft was still on the runway and the C-141 pilot decided to make a missed approach.

Donald J. Englebrecht
Captain, USAF
4th, MAS

● It looks as if there was a lack of



Box Lunches

Quonset Point, R.I. – The *Weekly Summary* of 23-29 May '71 carried an account of food poisoning in flight from box lunches. Although the incidence of food poisoning among aviators is infrequent, even occasionally is too much. I have flown in aircraft where the crew was so busy that more than the "safe elapsed time" passed before they could eat their box lunches.

A styrofoam container would retain cold much longer than the present cardboard box used for box lunches. Such a container might be more costly and possibly present some storage problems, but the cost would be nominal and a folding styrofoam box is feasible. Styrofoam inserts or a thin 1/8" liner to fit inside the present cardboard lunch box would be less costly but not as effective as a styrofoam box.

AOC T. A. Bair
NAS Weapons Department

● A styrofoam lunch box to keep food cold makes lots of sense to us. The Naval Safety Center has forwarded your letter to the Navy Subsistence Office, Washington, D.C.

coordination between the tower and the GCA controller. Let's hope it is not a frequent occurrence. But, in any case, the C-141 pilot's actions in executing a missed approach were correct. Cleared or not, it pays to remain alert.

Wait for the Signal

FPO, New York – Recently, a transient pilot on our line was given a signal to fold wings so that the plane captain could pull the wing struts. While the plane captain was removing the struts, the pilot started spreading the wings without warning. This could have caused serious injury to the plane captain, not to mention the possibility of damage to the aircraft.

I feel that pilots who are not in the squadron should be briefed on squadron procedures before they man aircraft for departure.

A Concerned Airman

● Right you are. All concerned must take measures in advance to insure that transient pilots and line personnel are in agreement on the procedures to be followed during the poststart checks and during the departure from the line.

A New Use For Old Stuff

NAS Oceana – I am writing in the hope that our idea will appear in the Letters column of APPROACH.

The idea is this. While going through our Quality Assurance files to remove old records, we came upon some photos originally taken for URs long since destroyed. Instead of destroying these photos we decided to use them in our squadron's campaign against unsafe procedures; the fight against FOD, etc.

We put the photos up in the maintenance shops and, to say the least, the response was very enthusiastic. A sampling of comments indicated an increased awareness by our maintenance personnel to the amount of damage that FOD and inattention to the job at hand can do to aircraft and support equipment.

These photographs depict FOD-ed engines, broken parts, corrosion, defective parts received from supply, etc. We are convinced that these photos are playing a big part in our safety program in as much as they are pictures taken in our squadron, not of some other squadron.

Judging from our experience, we believe that other squadrons, using their old UR photos in the same manner that we have, would derive similar benefits.

ADJ1 D. L. Campbell
VF-32 Q/A

● We agree heartily with your belief that other squadrons can derive benefits by displaying their UR photographs in a like manner. May we suggest that a space be reserved on the squadron's bulletin board for a photo of the most current culprit of a UR message. ◄

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Vol. 17 **approach** No. 3

CAPT W. E. Simmons
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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A section of versatile A-7 *Corsair IIs* sweeps across this month's cover as illustrated by staff artist Don Lips.

DEFENSIVE DRIVING LEAGUE CREED

We Believe that safe, efficient, and economical transportation by private motor vehicles is a positive goal.

We Believe that traffic accidents are a needless source of waste, misery, and death.

We Believe that the prevention of traffic accidents is our common responsibility.

We Believe that the development of driver skill in avoiding accidents is the best way to prevent them; from this it follows that every driver has a moral obligation to work at developing this skill.

We Believe that defensive driving offers us the best way to develop skills in avoiding accidents.

We Believe that traffic safety requires that these skills, once learned, be applied to all our future driving.

We Believe that group effort by drivers will greatly assist in the application of learned skills to our driving.

We Believe that driving an automobile in traffic is a social activity requiring courtesy and consideration for the rights, convenience and feelings of other users of the streets and highways, and that this attitude is a positive contribution to the harmony, efficiency, and safety of the transportation system.

We Believe that we should study and understand as fully as possible the techniques employed in the administration of all aspects of the nation's traffic control program; that we should lend discriminating support to official programs; and that we may be able to offer creative contributions to the solution of the problem.

We Believe in the value of all efforts to develop more crashworthy vehicles and safer highways, but we believe that the collective skill of defensive drivers will always be the chief safety factor of the transportation system.

We Believe that the quality and cost of products and services affect the safety and efficiency of the system and are the proper concern of all consumers.

We Believe that it is important to the cause of traffic safety that we exemplify the benefits of defensive driving by word and deed in our daily contacts with other drivers.

NAS Lemoore "The Golden Eagle"

Idea contributed by ADJ-3 Neil S. Kapp, VA-303, NAS Jax

oday is yesterday's reward for safety.

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